

**MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY  
ABANDONED MINE RECLAMATION BUREAU**

**BROOKLYN MINE RECLAMATION PROJECT**

**FINAL REPORT**



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**BROOKLYN MINE RECLAMATION PROJECT**

**MDEQ/AMRB 94-007**

**Granite County, Montana**

Prepared for:

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Abandoned Mine Reclamation Bureau  
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APR 08 1996

Prepared By:

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DECEMBER 1995

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## 1.0 INTRODUCTION

### 1.1 PROJECT DESCRIPTION

The Brooklyn Mine Reclamation Project consisted of providing all labor, materials, earthwork, and incidentals to construct a waste repository; demolish and dispose of one metal building and miscellaneous debris; excavate, transport, and dispose of approximately 18,300 bank cubic yards of waste rock and mill tailings in the waste repository; recontour, topsoil, and revegetate the excavation areas; recontour, apply soil amendments, topsoil, and revegetate three additional waste rock dumps; and reconstruct approximately 525 feet of stream bank and fish habitat features.

### 1.2 LOCATION AND ACCESS

The project site is located adjacent to Boulder Creek, a tributary to Flint Creek, in the Philipsburg Ranger District of the Deerlodge National Forest, Granite County, Montana. The site is in the S 1/2 of the NE 1/4 of Section 5, Township 7 North, Range 12 West. The site is accessed by travelling approximately 7 miles southeast along the Boulder Creek Road (Forest Route 676). This road is accessed by turning east off State Highway 1 at Maxville, a small community located 9 miles north of Philipsburg, Montana.

### 1.3 LAND OWNERSHIP

The Brooklyn Mine Site is located on the Deerlodge National Forest. This property is administered by:

U.S. Department of Agriculture/Forest Service (USFS),  
Deerlodge National Forest  
Philipsburg Ranger District  
P.O. Box H  
Philipsburg, Montana 59858  
(406) 859-3211

### 1.4 HISTORY

The Brooklyn Mine, located on the south slope of Pierre Hill, was initially known as the Pierre mine. A 600-foot adit was driven northward through limestone and shales at the Brooklyn site to intersect a porphyry dike 500 feet from the portal. The dike trended southeastwardly and was reportedly exposed in two shallow pits located below the mine. The porphyry carried abundant pyrite and locally contained nodules of rich lead ore. The minerals present included quartz, barite, sphalerite, galena, and lead and copper carbonates. Considerable ore was mined from a shaft located above the adit; the ore was presumably a deposit in limestone. Ore from the Brooklyn Mine was usually shipped to Helena for smelting. The main target metal was silver; however, the mine also produced a small amount of gold. An 80-ton shipment from the mine in

1907 averaged 37 ounces of silver, 13 percent zinc, 8 percent lead, and 1.7 percent copper. The Brooklyn mine was operated briefly from 1913 to 1914 after a 100-ton selective flotation mill was constructed on the property. The mill was reportedly destroyed by fire in 1939.

Saranac Mining, owned by various Spokane mining interests, operated the Brooklyn property and began actively reworking the mine from 1945 to 1948. In addition to the Brooklyn Mine, Saranac Mining reopened the Nonpareil Mine in 1947 and constructed a mill on the property. The mill reportedly had a capacity of 150 tons-per-day. The mill equipment included a 75 horsepower motor, a 100-ton ball mill, classifiers, two selective flotation batteries of 12 cells each, filters, and other various machinery. The mill was designed to pass ore through automatically by gravity. Although the mill was constructed on the Nonpareil property, historical accounts speculate that most of the ore developments were at the Brooklyn Mine.

## **1.5 PROJECT OBJECTIVES**

The primary objective of the Brooklyn Mine Reclamation Project was to protect human health and the environment in accordance with the guidelines set forth by the NCP. Specifically, the remedy selected must limit human and environmental exposure to the contaminants of concern and reduce the mobility of those contaminants to reduce impacts to the local surface water and groundwater resources.

## **2.0 RESPONSIBLE PARTIES**

### **2.1 MDEQ/AMRB COORDINATION**

The Montana Department of Environmental Quality/Abandoned Mine Reclamation Bureau (MDEQ/AMRB) Project Manager for the Brooklyn reclamation project was Jack Yates; his address is:

MDEQ/AMRB  
1520 East Sixth Avenue  
Helena, Montana 59620  
(406) 444-4957

### **2.2 USFS, DEERLODGE NATIONAL FOREST COORDINATION**

The USFS Project Manager was Bob Wintergerst, Deerlodge National Forest, Philipsburg Ranger District; his address is:

USFS, Deerlodge National Forest  
Supervisor's Office  
1820 Meadowlark Lane  
Butte, Montana 59701  
(406) 496-3400

## 2.3 RECLAMATION AND ENGINEERING PLAN

Pioneer Technical Services, Inc. (Pioneer), was assigned the responsibility of engineering and preparing the reclamation specifications prior to contractor selection. The address of Pioneer is:

Pioneer Technical Services, Inc.  
P.O. Box 3445  
Butte, Montana 59702  
(406) 782-5177

## 2.4 QUALITY CONTROL INSPECTION

Pioneer performed the quality control inspection. Bill Bullock and Brad Archibald performed the project engineering functions. Dawn Clark and Doug Richmond acted as the primary construction inspectors.

## 2.5 CONTRACTOR

The successful low bidder for the project was Environmental Reclamation Northwest, LLC (ERNW), a limited liability company formed by Environmental Reclamation of Idaho, Ltd. Co., of Wallace, Idaho and MSE Infrastructure Services, Inc., of Butte, Montana. The address of ERNW is:

Environmental Reclamation Northwest, LLC  
P.O. Box 3809  
Butte, Montana 59702  
(406) 782-0463

## 3.0 **CHRONOLOGICAL LISTING OF EVENTS**

### 3.1 BOULDER CREEK DIVERSION CONSTRUCTION

A stream diversion structure was necessary to isolate Boulder Creek from the waste rock excavation activities. Due to the tight time frame associated with this project, the stream diversion structure was procured and installed by Pioneer with the assistance of the Montana Conservation Corp. Construction of the Boulder Creek stream diversion structure was initiated on July 17, 1995; continued on July 18, 19, 20, 24, 25; and was completed on July 28, 1995.

The diversion structure was constructed from half-round 36-inch diameter corrugated metal pipe. The pipe was raised slightly above the creek bed on jack-leg supports at ten foot centers to maintain a constant seven percent grade. A small dam was constructed at the inlet to divert the majority of the flow of Boulder Creek into the pipe.



### 3.2 PRE-BID CONFERENCE

The Brooklyn Mine Reclamation Project Pre-Bid Conference was as held on July 11, 1995, at 1:00 p.m. at the Brooklyn Mine Site. The conference was attended by representatives from the MDEQ/AMRB, Pioneer, the USFS Philipsburg Ranger District, six potential prime contractors, two potential subcontractors, and a material vendor. Meeting minutes and the attendance sign-in sheet for this conference are presented in Appendix A of this report.

### 3.3 BID DATE

The bid opening date was July 20, 1995, at 2:00 p.m. at the MDEQ/AMRB's office at 1625 Eleventh Avenue in Helena, Montana.

### 3.4 LOWEST BIDS

Four (4) qualified bidders responded with bids ranging from \$728,220.36 to \$1,038,000.00. The Engineer's estimate was \$854,787.50. The bid tabulations are presented in Appendix B. The bids are summarized in Table 1.

### 3.5 CONTRACT AWARD

The contract was awarded to Environmental Reclamation Northwest, LLC (ERNW) who was the low bidder. The prime contractor's address is shown under Section 2.1. Table 2 lists the ERNW Subcontractors used for the project.

### 3.6 CONTRACT AGREEMENT

The Contract Agreement was signed on July 27, 1995. The Notice to Proceed was issued on August 1, 1995, for immediate start-up. The contractor was to complete the specified work within sixty (60) consecutive calendar days for an anticipated completion date of September 30, 1995. A change order was issued during the construction period extending the time to October 6, 1995. The work was completed by October 6, 1995.

### 3.7 CONSTRUCTION START-UP

The Pre-Construction Meeting was held on July 31, 1995, at 10:30 a.m. at Pioneer's office in Butte, Montana. Jack Yates (MDEQ/AMRB) and Bill Bullock (Pioneer) presided over the meeting. Additional attendees included Brian Benson, Tib Costin, Kris Paffhausen, and Jim Kambich of ERNW and Doug Richmond of Pioneer. Meeting minutes are included in Appendix C of the this report.

**TABLE 1**  
**BID SUMMARY**

BID ITEM	ENVIRONMENTAL RECLAMATION NORTHWEST	MUNGAS CONSTRUCTION	MONTGOMERY CONSTRUCTION	JTL GROUP
Mob., Bonding, Insur.	\$97,900.00	\$139,000.00	\$140,000.00	\$181,131.50
Access Road Improv.	\$8,200.80	\$30,001.60	\$6,800.00	\$10,880.00
Clear & Grub	\$12,000.00	\$8,250.00	\$16,200.00	\$15,000.00
Repository Excavation	\$31,464.00	\$76,000.00	\$30,400.00	\$41,800.00
Organic Amendment	\$82,807.50	\$100,198.60	\$91,500.00	\$122,000.00
Repos. Subgrade Prep.	\$2,980.00	\$1,117.50	\$11,175.00	\$7,450.00
GCL Bottom Liner	\$36,654.00	\$32,407.50	\$44,700.00	\$50,287.50
B-grade GCL	\$15,412.80	\$11,918.40	\$20,280.00	\$15,600.00
Leachate Collection	\$1,530.00	\$1,006.40	\$1,360.00	\$1,700.00
Leachate Transmission	\$1,372.00	\$580.16	\$784.00	\$2,352.00
Geocomposite	\$35,313.00	\$35,387.50	\$59,600.00	\$48,425.00
Evapor. Pond Excav.	\$459.66	\$1,002.45	\$1,304.00	\$1,956.00
Evapor. pond GCL	\$708.64	\$1,650.34	\$688.00	\$1,720.00
Sampling Barrel	\$250.00	\$1,000.00	\$400.00	\$350.00
Riprap Outfall	\$500.00	\$100.00	\$500.00	\$1,000.00
Evap. Pond Cover Soil	\$269.92	\$1,000.16	\$1,120.00	\$700.00
Building Demolition	\$1,900.00	\$9,000.00	\$2,000.00	\$3,000.00
Excav. TP1 and WR5	\$104,859.00	\$173,850.00	\$91,500.00	\$109,800.00
Repos. Cap GCL	\$32,333.00	\$32,407.50	\$52,150.00	\$50,287.50
Repos. Cap	\$32,035.00	\$31,439.00	\$59,600.00	\$48,425.00
Repos. Cap Cover Soil	\$13,503.60	\$10,018.80	\$48,400.00	\$14,520.00
Adit French Drain	\$1,650.00	\$2,282.50	\$3,500.00	\$2,800.00
Cover Soil for TP1/WR5	\$19,735.40	\$32,827.20	\$48,850.00	\$34,195.00
Reconst. Stream Channel	\$11,670.75	\$15,566.25	\$6,000.75	\$10,500.00
Add. Boulder Install.	\$5,850.00	\$3,000.00	\$1,250.00	\$4,000.00
Waste Rock Grading	\$24,350.01	\$14,600.00	\$34,500.00	\$19,199.00
Lime Application	\$8,797.03	\$14,870.11	\$28,140.00	\$10,552.50
Waste Rock Cover Soil	\$29,891.00	\$26,980.00	\$35,500.00	\$46,150.00
Repos. Run-on Diversion	\$1,230.15	\$1,852.60	\$1,475.00	\$3,835.00
Repos. Run-off Diversion	\$468.00	\$306.00	\$450.00	\$1,980.00
Waste Rock Run-on	\$959.10	\$908.50	\$1,150.00	\$3,220.00
Fert. and Drill Seed	\$12,688.98	\$8,773.99	\$12,400.00	\$10,540.00
Fert. and Hydroseed	\$19,799.02	\$18,600.01	\$15,300.00	\$21,879.00
Straw Mulch	\$5,525.01	\$4,100.00	\$3,100.00	\$4,805.00
Hydromulch	\$7,498.99	\$6,399.99	\$5,100.00	\$7,522.50
Install Erosion Mat	\$33,017.50	\$40,042.50	\$42,150.00	\$49,175.00
Construct Fences	\$26,267.50	\$26,600.00	\$36,841.00	\$43,225.00
Obliterate Roads	\$3,616.00	\$5,120.00	\$4,800.00	\$32,000.00
Discharge Permit	\$650.00	\$650.00	\$650.00	\$650.00
Straw Bales	\$1,200.00	\$2,000.00	\$2,000.00	\$1,550.00
Silt Fence	\$903.00	\$1,575.00	\$1,575.00	\$1,837.50
<b>Totals</b>	<b>\$728,220.36</b>	<b>\$924,390.56</b>	<b>\$965,192.75</b>	<b>\$1,038,000.00</b>

**TABLE 2**  
**ERNW SUBCONTRACTORS**

Parke Logging  
143 E. Mulligan Trail  
Drummond, MT 59532  
(406) 288-3265  
Role: Logging, grubbing,  
Cat D8 & Road Grader  
Rental

North Trucking  
Vergobie Gulch  
Kellogg, ID 83837  
(208) 786-3983  
Role: Trucking

Little Bear Construction  
Box 981, Star Route  
Clinton, MT 59825  
(406) 825-7366  
Role: Trucking, Excavator  
Rental

Huber Sanitation  
P.O. Box 35  
Cataldo, ID 83810  
(208) 682-3134  
Role: Trucking

Mike Jaussi  
Drummond, MT 59832  
(406) 288-3613  
Role: Trucking, Loader  
Rental

Western Reclamation  
30 Mountain Splendor Dr.  
Bozeman, MT 59715  
(406) 691-5355  
Role: Lime Incorporation,  
Drill Seeding

Jordan Contracting  
P.O. Box 577  
Anaconda, MT 59711  
(406) 563-8276  
Role: Trucking

Tri-State Hydroseeding  
P.O. Box 147  
Kingston, ID 83839  
(208) 682-3565  
Role: Hydroseeding and  
mulching

### 3.8 CHANGE ORDERS

Two change orders were written for this project. Copies of the change orders are presented in Appendix D of this report. Change Order No. 1 increased the contract amount by \$45,207.89 and extended the contract completion date to October 6, 1995. The purpose of Change Order No. 1 was to accommodate removal of dry tailings from the Nonpareil Millsite and disposal in the Brooklyn Mine Repository. Change Order No. 2 decreased the contract amount by \$5,535.86 with no change in the contract completion date. The purpose of Change Order No. 2 was to adjust for minor changes in actual quantity bid items.

### 3.9 WORK STOPPAGES

No work stoppages occurred on this project. Heavy rains attributed to four days of minimal construction activities.



### 3.10 REQUESTS FOR PAYMENT

Four (4) payment requests were made during this project. Payment Request No. 1 was for the period of July 31 through August 15, 1995, and the amount earned, less retainage, was \$213,205. Payment Request No. 2 was for the period of August 16 through August 31, 1995, and the amount earned, less retainage and previous payments, was \$201,395.74. Payment Request No. 3 was for the period of September 1 through September 15, 1995, and the amount earned, less retainage and previous payments, was \$91,777.60. Payment Request No. 4, the final payment request, was for the period of September 16 through October 6, 1995, and the amount earned, less previous payments, but including past retainage, was \$261,517. Copies of the Payment Request forms are presented in Appendix E of this report.

### 3.11 SUBSTANTIAL COMPLETION

The date of Substantial Completion was October 13, 1995.

### 3.12 FINAL COMPLETION AND APPROVAL

A final field inspection was conducted by Jack Yates (MDEQ/AMRB) on October 13, 1995. The Final Completion date is one year from the Substantial Completion date or October 13, 1996. Copies of the Affidavit on Behalf of the Contractor, the Contractor's Certificate of Completion, the Consent of Surety to Final Payment, the Certificate of Substantial Completion, and the Certificate of Acceptance are presented in Appendix F.

### 3.13 FINAL PAYMENT

Final Payment was made to the contractor on October 30, 1995. A copy of the final payment request form (Payment Request No. 4) has been included in Appendix E.

## 4.0 CONSTRUCTION

### 4.1 DESCRIPTION OF THE PROJECT PLAN

The work consisted of providing all labor, materials, earthwork, and incidentals necessary to construct short access roads; construct a waste disposal repository; demolish and dispose of one metal building and other miscellaneous debris; excavate, transport, and dispose of approximately 18,300 cubic yards of waste rock and mill tailings in the repository; construct an adit discharge french drain; recontour, topsoil, and revegetate the excavation areas; recontour, apply soil amendments, topsoil, and revegetate three additional waste rock dumps; reconstruct approximately 525 feet of stream channel and adding habitat enhancement features; and construct run-on control ditches.

The purpose of this reclamation project was to limit human and environmental exposure to the contaminants of concern and reduce the mobility of these contaminants to mitigate impacts to the local surface water and ground water resources. The reclamation plan involved removing those waste sources at the Brooklyn Mine which were the principal sources of concern (the tailings pond and waste rock dump #5) and disposing of these wastes in a constructed repository. The repository was constructed on the bench area located directly south of waste rock dump #3. The repository bottom consists of a single geosynthetic clay (GCL) bottom liner with an integral drainage layer and a low maintenance leachate collection and removal system. A secondary layer of B-Grade (off-specification) GCL was installed to protect the primary liner from potential chemical reaction. The total surface area of the repository required to contain the specified wastes is approximately 1.5 acres. Approximately 3.0 acres of timber was removed to accommodate repository construction and removal of tailings dispersed throughout sparsely timbered areas. After the specified wastes were loaded and compacted in the repository, a multi-layered, lined cap was constructed overlying the wastes, and the cap was fertilized, seeded, and mulched. The excavated areas (tailings and waste rock dump #5 locations) were backfilled to contours matching the surrounding topography, fertilized, seeded, and mulched. The stream channel adjacent to waste rock dump #5 was reconstructed in a step-pool configuration similar to the undisturbed stream channel located upstream of the project. Excess soil originating from the repository excavation was amended with compost and used as cover soil in the excavated areas. In addition, a subsurface limestone french drain will be constructed below the adit located at waste rock dump #5 to treat a minor intermittent adit discharge.

The other large waste rock dumps located at the site (waste rock dumps #1, 2, and 3) were graded out to approximately match the surrounding topography. Lime was incorporated into the upper 12-inches of the dump material, as needed. The dumps were covered with soil (previously amended with compost), fertilized, seeded, and mulched in place. Excess soil from the repository excavation was also used to cover the waste rock dumps. Slopes flatter than 2.5:1 were mulched by crimping straw and drill seeded. Slopes steeper than 2.5:1 were hydroseeded with a mixture of wood fiber mulch, seed, fertilizer, and tackifier. Additionally, biodegradable erosion control mat (straw/coconut fiber woven mat) was installed on slopes steeper than 2.5:1 following the hydroseeding procedures.

Ditches were constructed to divert run-on away from each of the reclaimed areas and the repository. Temporary fences were constructed to surround each of the reclaimed source areas as well as the repository cap to allow for the establishment of vegetation without interference from livestock or wildlife. Several of the temporary roads constructed at the site were obliterated and reclaimed; however, some of the roads remain intact to allow access for monitoring the progress of the reclaimed areas (and maintenance when necessary) for a period of one to several years.

#### 4.2 MAJOR EQUIPMENT LIST

Major equipment used on the Brooklyn Mine Reclamation Project is listed in Table 3.

**TABLE 3  
MAJOR EQUIPMENT LIST**

TYPE	YEAR	MAKE/MODEL	HORSE-POWER	CAPACITY
Excavator	1990	Linkbelt 2700CIII	100	1 cy bucket
Excavator	1991	Linkbelt 2700CIII	100	0.75 cy bucket
Excavator	1992	Kamatsu 200LC	136	2.0 cy bucket
Bulldozer	1974	Caterpillar D8H	235	
Bulldozer	1968	Caterpillar D6	125	
Front-end Loader	1979	Caterpillar 950	130	3.0 cy bucket
Front-end Loader	1975	Payloader	175	5.0 cy bucket
Motor Grader	1984	Champion 720A	153	
Vibratory Roller	1994	Ingresol Rand	65	72" width
Water Truck	1985	Ford F700	150	1,800 gallon
Skid Loader	1994	Bobcat 753	42	2 cy bucket
Track Skid Loader	1995	ASV	80	2 cy bucket
Bulldozer/Limespreader	1988	Caterpillar D6	125	
Drill Seeder		Shop-Built		
Hydroseeder	1985	Lincoln		3000 gallon
Boom Truck		Ford		
Tree Feller/Buncher				
Limber				
Log Skidder		Caterpillar D6	125	
8 Highway Dump Trucks	1975-1991		235-300	12 cy bed

#### 4.3 CONTRACTOR EMPLOYEES

A total of thirty (32) different employees worked on the Brooklyn Project including ERNW permanent and temporary employees and subcontractors. The typical daily crew consisted of the foreman, two or three excavator operators, a bulldozer operator, three to five dump truck drivers, and three to ten laborers. Occasionally, appropriately skilled laborers would be used to operate the front-end loader, skid loaders, the vibratory roller, or the motor grader.

#### 4.4 CONSTRUCTION ACTIVITIES

Construction of the Boulder Creek stream diversion structure was initiated on July 17, 1995, by Pioneer employees and the Montana Conservation Corp. Construction continued on July 18, 19, 20, 24, 25 and was completed on July 28, 1995. Daily activities are as follows:

August 1, 1995 - Contract-related construction activities began. Parke Logging began felling trees in the tailing spill/soil mixing area and began skidding logs out with their Caterpillar (Cat)



D6. ERNW mobilized the two Linkbelt excavators and the Cat D6 bulldozer to the site. Parke Logging completed tree felling in the mixing by 2:00 p.m. and began felling trees along the toe of WR3 and the repository area. ERNW moved a Linkbelt excavator to the road down to WR5 to experiment with excavation on the road surface for widening purposes. The excavator was unable to rip apart the rock outcrop material.

August 2, 1995 - Regrading of WR1 was initiated with one of the Linkbelt excavators. Tailings excavation and consolidation was initiated with the Cat D6 bulldozer. Parke Logging continued tree felling in the repository area. The second Linkbelt excavator was moved to the top of WR3 to decrease side-slopes for bulldozer pushing. A laborer began demolition of the metal shed on WR5. Parke Logging completed tree felling in the repository area.

August 3, 1995 - Regrading of WR1 with one Linkbelt excavator and consolidation of tailings in the soil mixing area with the Cat D6 continued. The second Linkbelt excavator continued to bail waste rock on WR3. Laborers installed silt fence along the toe of WR3 and at the end of TP1. Parke Logging began limbing and decking logs at the southwest corner of the repository clearing.

August 4, 1995 - Regrading of WR1 continued with one of the Linkbelt excavators and the Cat D6. Parke Logging continued decking logs and grubbing out stumps in the repository area. The second Linkbelt excavator was used for approximately two hours on WR5 to complete demolition of the metal shed and stack other miscellaneous debris.

August 5, 1995 - Regrading of WR1 continued with both Linkbelt excavators and the Cat D6. Parke Logging mobilized their Cat D8H to the site to assist with clearing and grubbing in the repository. The Cat D8 was also used to rip the first lift on the road to WR5. This Cat D8 was leased to ERNW and remained on-site for the duration of the project.

August 6, 1996 - No activities occurred on this day.

August 7, 1995 - Regrading of WR1 was completed with a Linkbelt excavator. Parke Logging continued clearing and grubbing in the repository area with the Cat D8 and their Cat D6.

August 8, 1995 - Excavation of the repository began with one Linkbelt excavator and three dump trucks. Excavated soil was dumped in the upper end of the soil mixing area. ERNW also mobilized the Cat 950 front-end loader and the Bobcat 743 skid loader to the site. Loggers continued decking logs and stacking slash in the repository area. The ERNW Cat D6 was broken down and the second Linkbelt was idle. The Bobcat was used to excavate a containment area for the fuel truck and remove tailings along the tree interface around the soil mixing area. The Cat D8 was used to complete excavation and consolidation of tailings within the boundaries of the soil mixing area. After completion of this task the Cat D8 was moved to the repository to start pushing soil to the excavator loading trucks. Approximately 1,000 loose cubic yards were removed from the repository excavation.

August 9, 1995 - Repository excavation continued with the Cat D8 and two Linkbelt excavators loading three dump trucks. Cycle times for the dump trucks were approximately ten minutes. Log trucks began removing logs from the deck. Additional silt fence was constructed around WR3.

August 10, 1995 - Repository excavation continued with the Cat D6 and the Cat D8 pushing to both Linkbelt excavators. Five dump trucks were in the cycle. The dump trucks were running at approximately six minute cycles. Eko-Compost of Missoula delivered one load of compost to the Nelson gravel pit between Maxville and Princeton, which was to serve as the temporary storage location. Logging trucks continued to remove logs from the deck.

August 11, 1995 - Repository excavation continued with the Cat D8 pushing to both Linkbelt excavators. Four dump trucks were in the cycle. The fifth dump truck began hauling compost up from the gravel pit. Repository subgrade preparation began along northern edge using the road grader.

August 12, 1995 - Bentomat® GCL for the repository bottom was delivered to the site. Compost continued to be delivered to the gravel pit. Repository excavation continued with the Cat D8 pushing to both Linkbelt excavators. Four dump trucks were in the cycle. The fifth dump truck continued hauling compost up from the gravel pit.

August 13, 1995 - Repository excavation continued with the Cat D8 pushing to both Linkbelt excavators. Four dump trucks were in the cycle. Final grade was achieved over approximately 75 percent of the repository bottom.

August 14, 1995 - The geonet and filter fabric (geocomposite) were delivered to the site. Repository excavation continued with the Cat D8 pushing to both Linkbelt excavators. Four dump trucks were in the cycle. Mixing of soil excavated from the repository and compost was initiated in the soil mixing area. Logging trucks continued to remove logs from the deck.

August 15, 1995 - Repository excavation continued with the Cat D8 pushing to both Linkbelt excavators. Four dump trucks were in the cycle. Bed rock was encountered in a small area of the repository floor approximately one foot above grade. Soil mixing continued in the morning until the Cat D6 broke down.

August 16, 1995 - ERNW mobilized the Kumatsu 200LC excavator and an Ingresol Rand vibratory roller to the site. Repository excavation continued intermittently with the Cat D8 pushing to one Linkbelt excavator and the Kamatsu excavator. Two dump trucks were in the cycle. The Cat D8 was used for approximately one hour to rip the bedrock encountered in the repository. Bottom grades were adjusted to cover the unrippable bedrock without impacting repository capacity or drainage grades.

August 17, 1995 - Repository excavation was completed with the Kamatsu excavator and two dump trucks. The Cat D8 and one Linkbelt excavator begin consolidating tailings within TP1.



August 18, 1995 - Two dump trucks hauled compost to soil mixing area. Cover soil removed from the repository was hauled to WR1 by two dump trucks. The Cat D8 and Kamatsu excavator worked on road construction down to WR5. Work on repository continued with vibratory roller, grader, and linkbelt excavator. Eko-Compost delivered one load of compost to the gravel area. Compaction was tested in the repository with a Nuclear Density Gauge and revealed compaction of side walls and floor is within acceptable range.

August 19, 1995 - Subgrade preparation continued using the motor grader and vibratory roller. One link belt excavator was used to begin cutting the leachate collection trench. The Cat D8 was down with brake problems.

August 20, 1995 - Fifteen rolls of GCL laid on northwest portion of repository. Nine rolls of Geonet laid on west side of repository.

August 21, 1995 - Ten rolls of GCL liner laid on northeast portion of repository.

August 22, 1995 - Geonet and ten rolls of GCL liner laid in repository, approximately one-half the repository (North portion) has Geonet and GCL liner laid. Work on south portion of repository continued with vibratory roller and grader. Excavation of leachate trench from repository began with Linkbelt excavator. Blasting on road to WR5 occurred to improve access. The Cat D8 was non-operational and the Cat D6 had a hose failure. South grade of repository prepared. Five nuclear density tests were performed on southern portion of repository with all in acceptable range.

August 23, 1995 - Improved the GCL liner placement in the anchor trench of the repository. Additional excavation of leachate ditch occurred with the Linkbelt. Leachate pipe placed in trench to collection pond. Last of GCL liner laid on south portion of repository. Transition pipe and perforated pipe were put in place. Leachate pipe was wrapped with filter cloth and covered with gravel then Geonet. Tailings from TP1 were hauled to the repository. One Linkbelt excavator and the Cat D8 are broke down.

August 24, 1995 - Blasted on WR5 road to improve accessibility. The Cat D8 worked on WR5 road to further widen after blast. Linkbelt excavator completed filling leachate trench. Dozer work completed on upper WR2 with the Cat D6. GCL liner and Geocomposite are laid along west slope of repository. Anchor trench on west side of repository is filled. First lift of waste material was placed on west slope.

August 25, 1995 - Removal of waste material at WR5 near creek began. MDEQ approved burying of wood and iron wastes in the repository. USFS Fisheries Biologist approved locations of habitat structures in Boulder Creek

August 26, 1995 - More rolls of GCL liner delivered for repository. Waste material continued to be removed from WR5 area by two excavators (Linkbelt and Kamatsu) and hauled to repository by four haul trucks (one was broke down) with approximately 14 minute cycle time. Haul trucks



were loaded approximately one-half to two-thirds full of material by excavator. The Cat D8 worked on WR3 then moved to repository where it spread and compacted waste material. Linkbelt excavator at the topsoil/compost area was broke down for day. Front end loader worked in repository spreading and compacting waste material from WR5 and built berm of rocky soil around edge of repository. Fencers began setting posts around WR1 and WR2.

August 27, 1995 - Removal of waste material with Linkbelt and Kamatsu excavators from WR5 to the repository continued with five haul trucks operating at a rate of 3 to 4 loads/hour. A total of 113 loads were removed from WR5. Work on southwest corner of repository occurred.

August 28, 1995 - Removal of waste material with Linkbelt and Kamatsu excavators from WR5 to the repository continued with five haul trucks operating. The Cat D8 worked on finishing the grading on WR3.

August 29, 1995 - Removal of waste material with Linkbelt and Kamatsu excavators from WR5 to the repository continued with four haul trucks operating. One hundred fifty-five loads of waste material were removed from WR5. Cycle times varied from 15 to 30 minutes with the average around 18 minutes. First-half of day haul trucks only loaded 1/2 to 3/4 full; after noon they were loaded near capacity. One haul truck hauled compost from the gravel area to soil mixing area. Posts were placed near entrance of repository. Grading of waste material in repository with Cat D6 occurred. Catchment for waste material along creek was constructed.

August 30, 1995 - Removal of waste material with Linkbelt and Kamatsu excavators from WR5 (Creek area) to the repository continued with five haul trucks operating. Mixing of topsoil occurred with Cat D8 and Linkbelt excavator. The Cat D6 was used in repository to spread out waste material from WR5.

August 31, 1995 - Removal of waste material with Linkbelt and Kamatsu excavators from WR5 (Creek area) to the repository continued with five haul trucks operating. The Cat D6 leveled and spread waste material in repository from WR5 to approximately three foot lifts before compaction. The Cat D8 and Linkbelt excavator worked on grading WR2. One hundred fifty-eight loads of waste material were removed from WR5.

September 1, 1995 - Removal of waste material with Linkbelt and Kamatsu excavators from WR5 (Creek area) to the repository continued with five haul trucks operating and they appeared to be loaded near capacity for the first-half of day; after noon only the Kumatsu operated. The Cat D8 and Linkbelt excavator continued to grade WR2 for the first-half of day; after noon only the Cat D8 worked on WR2. The Cat D6 spread and leveled waste material from WR5. The Cat D6 moved to WR2 from the repository.

September 2, 1995 - Grading of WR2 was completed with the Cat D8. Trucks began hauling topsoil down to WR5 area for turnaround after unloading waste material from WR5 in the repository (approximate cycle time 25 min.). Ninety-six loads were removed from WR5 with 64 loads of topsoil brought down to WR5.

September 3, 1995 - Removal of waste material with Linkbelt and Kamatsu excavators from WR5 (creek area) to the repository continued with five haul trucks operating (approximate cycle time of 18 minutes). Turbidity samples were taken on the creek by USFS.

September 4, 1995 - Linkbelt excavator finished the sides on WR2, reworked the waste material on upper portion of hillside, and constructed a drainage ditch. Removal of contaminated material continued from WR5, although, due to lack of space, the cycle times slowed to approximately 22 minutes. Topsoil material was hauled down to WR5 after material from WR5 was dumped at the repository. Pipe with running water was exposed near adit while excavating. Ninety-six loads were removed from WR5 with 21 loads of topsoil material brought to WR5.

September 5, 1995 - Silt fence and closure fence were constructed. Road work was conducted to improve run-off control better. Catch basin at bottom of TP1 was constructed. Drainage ditches were constructed around WR5. Twenty-nine loads of waste material were removed from WR5.

September 6, 1995 - Removal of contaminated material from WR5 and the hauling of topsoil mixture back down to WR5 continued with haul truck cycles averaging approximately 23.5 minutes (86 loads out of WR5 and 31 loads into WR5). The Cat D8 slid down WR1 into some trees.

September 7, 1995 - Removal of contaminated material from WR5 and the hauling of topsoil mixture back down to WR5 continued. Material in the repository from WR5 was graded with the Cat D6, then the Cat D6 moved up to WR1 and completed grading out the topsoil.

September 8, 1995 - No construction work occurred due to rain. Erosion control measures temporarily failed along several locations at the creek. Hay bales were moved around to reduce erosion sedimentation to the creek.

September 9, 1995 - No work occurred due to weather. The ERNW foreman was on-site to maintain temporary erosion control BMPs.

September 10, 1995 - No work occurred due to weather. The ERNW foreman was on-site to maintain temporary erosion control BMPs.

September 11, 1995 - Twenty loads of clean dirt were hauled down to WR5 for building road. The Cat D8 used for building road down in WR5. Both Linkbelts were broken down along with the Cat D6. Areas seeded for revegetation included WR2 (1 acre) drilled and hydroseeded, WR1 (0.7 acre) hydroseeded, WR3 (1.5 acres) drill seeded, tailings area (2.2 acres), and road revegetation (0.71 acre).

September 12, 1995 - Clean soil was hauled down to WR5 by three haul trucks. Removal of waste material continued down at WR5 with the Kamatsu excavator. The Cat D8 was down at WR5 regrading the slopes with clean soil. One of the Linkbelt excavators was moved down to WR5 to begin placing clean soil on the steep back slopes. Two stream structures were placed in stream.



September 13, 1995 - Continued work constructing and placing stream structures. Geonet was delivered. Remaining waste rock was removed from WR5 with Kamatsu excavator and two haul trucks. The Cat D8 spread topsoil on WR2. Cost of \$9.00/yd<sup>3</sup> for tailings removal from the Nonpareil mine site to the Brooklyn Repository was approved. One hundred feet of stream diversion pipe was removed from the stream.

September 14, 1995 - The Kamatsu, Cat D6, and three haul trucks began removal and hauling of tailings from the Nonpareil site to the Brooklyn Repository. An additional one hundred feet of stream diversion pipe was removed from the stream. Two more stream structures were put in place. The lime spreader and Cat D6D were mobilized to the site by Bernie Jensen.

September 15, 1995 - Removal of tailings from the Nonpareil with the Kamatsu excavator and the Cat D6, and transportation of them with three haul trucks to the Brooklyn Repository continued (66 loads were removed). Temporary dam was removed from the stream. Completed placement of structures in stream. All stream structures and stream bank reconstruction was completed in compliance with the 124 permit requirements.

September 16, 1995 - Removal of tailings from the Nonpareil with the Kamatsu excavator and the Cat D6, and transportation of them with four haul trucks to the Brooklyn Repository continued (109 loads were removed). The Cat D8 spread cover soil at WR5. Two loads of limestone rock were delivered for the adit french drain.

September 17, 1995 - Removal of tailings from the Nonpareil with the Kamatsu excavator and the Cat D6, and transportation of them with four haul trucks to the Brooklyn Repository continued (102 loads were removed).

September 18, 1995 - Removal of tailings from the Nonpareil with the Kamatsu excavator and the Cat D6, and transportation of them with four haul trucks to the Brooklyn Repository continued (96 loads removed). French drain was constructed for adit discharge and run-off ditch. Began hauling cover soil down to Nonpareil site (21 loads brought in).

September 19, 1995 - Both fence work and shaping of the repository occurred. Eighty-two tons of 95% pure calcium carbonate was delivered to the gravel pit area from Big Horn Limestone. The calcium carbonate was hauled up to the waste rock dumps using three of the end-dump trucks. Seventeen loads of topsoil were hauled down to the Nonpareil site.

September 20, 1995 - Compost was hauled up to soil mixing area. Wet weather delayed construction activities. Excavated area at the Nonpareil was GPS'ed for exact area determination.

September 21, 1995 - Haul trucks were hauling compost up to the soil mixing area and taking mixed soil back down to the Nonpareil site. Lime was spread on WR3 with Bernie Jensen's Cat D6. The lime spreader was calibrated for the specified application rate.



September 22, 1995 - Excavation of the drainage trench occurred with the Linkbelt excavator. After completing the drainage trench, the anchor trench was constructed at the south end of the repository with the Linkbelt excavator. The vibratory roller compacted the repository. Lining and Geonetting of the repository cap began (one-half completed). Four loads of cover soil were hauled down to the Nonpareil site.

September 23, 1995 - Lime was tilled into WR2. Cover soil was hauled up to WR2 for first one-foot lift. Wet weather prevented much work from occurring. Repaired spreader. Continued repository cap construction by placing 14 rolls of Bentomat.

September 24, 1995 - Anchor trench construction was completed on south end with the Linkbelt excavator. ASV track mounted skid loader was used for spreading cover soil on the repository cap.

September 25, 1995 - The Cat D6 was used for pushing final lift onto the repository. Cover soil was hauled to WR3 and spread with the use of two haul trucks and the Cat D8. ASV track mounted skid loader worked on finishing covering the liner cap on the repository.

September 26, 1995 - Surveyed the slope of the diversion ditch on the east side of the repository. Covering and spreading of WR3 proceeded with the Cat D8 and two haul trucks (54 loads into). Topsoil was also hauled to WR2 (50 loads into). The placing and spreading of topsoil on repository continued with the ASV track mounted skid loader covering the liner cap on the repository (69 loads). East diversion ditch of repository was blended in with hillside.

September 27, 1995 - Continued hauling cover soil to WR2. Began spreading of cover soil in the tailings area. Began discing compacted soil on WR3 and the repository with box scrapper.

September 28, 1995 - Continued discing the repository and WR3. Continued pushing cover soil on the tailings area. Drill seeded the bottom of WR5.

September 29, 1995 - WR5 was hydroseeded with Silva fiber wood mulch. Work on erosion mat was completed along creek. WR3, TP1, and 90 percent of the Nonpareil were drill seeded. Trees and shrubs (dogwood, alder, Lodgepole, and willows) were placed along creek, slides off road, and toe of hill at WR5, after which these areas were hydroseeded.

September 30, 1995 - Cover soil was spread on tailings area with the Cat D8. Slash piles were separated. WR1 and WR2 were hydroseeded. Straw was delivered and stored at gravel pit area and road junction into mine site.

October 1, 1995 - Laid erosion control mat on WR5. Surveyed WR1 and WR3.

October 2, 1995 - Laid erosion control mat on WR2. Surveyed the repository, TP1, WR5, and WR2. Finished fence around WR1.

October 3, 1995 - Straw mulched TP1, soil mixing area, WR5, repository cap, and most of WR3.

October 4, 1995 - Loaded out diversion pipe. No other work continued due to snow.

October 5, 1995 - Surveyed repository toe ditch. Fence work continued around repository. The Cat D8 was demobilized. Measurements were conducted on all ditches and fence perimeters for actual quantity evaluation.

October 6, 1995 - Erosion mat placement of WR1 was completed. Straw spreading on toe of WR3 was completed.

October 7, 1995 - Straw crimping was completed on TP1, WR3, and the repository cap. WR5 and WR2 were not crimped due to muddy conditions.

October 10, 1995 - Media and awards day. The Cat D6 was demobilized. General site clean up was conducted by the laborers.

October 11, 1995 - Continued work on fence around repository and continued demobilizing.

October 12, 1995 - Finished fence work around repository and completed demobilizing.

October 13, 1995 - Final inspection issued and passed for all items with the exception of the installation of a gate across WR5.

#### 4.5 QUANTITIES USED

Work items were bid on lump sum, design quantity, and unit price basis. Table 4 provides a list of each bid item, the unit of measurement, and the estimated verses actual quantity. Design quantities were generally field-verified as being within the contract range. Verification methods included surveying and truck-counts. No disputes were formally raised by the Contractor.

### 5.0 PROJECT COSTS

#### 5.1 PAY REQUESTS

Four pay requests were processed for this project as discussed in Section 3.10 above. Copies of the pay requests are included in Appendix E.

#### 5.2 TOTAL PROJECT COSTS

The construction cost for this project was \$767,895. ERNW was awarded the contract and received \$767,895. Their original bid was \$728,223 with two change orders issued for \$45,208 and (\$5,536).

**TABLE 4  
QUANTITIES SUMMARY**

ITEM NO.	ESTIMATED QUANTITY	ACTUAL QUANTITY	UNIT	DESCRIPTION
1)	1	1	Lump Sum	MOBILIZATION, BONDING, AND INSURANCE
2)	680	680	Lineal Feet	ACCESS ROAD IMPROVEMENTS
3)	1	1	Lump Sum	CLEARING AND GRUBBING INCLUDING TIMBER HARVEST
4)	15,200	15,200	Cubic Yards (D. Q.)	REPOSITORY EXCAVATION
5)	610	610	Dry Tons - Equiv.	ORGANIC AMENDMENT (Dry Weight Basis)
6)	7,450	7,450	Square Yards	PREPARE REPOSITORY SUBGRADE
	7,450	7,450	Square Yards	<u>INSTALL REPOSITORY GCL LINER</u> GCL Bottom Liner
	3,120	3,120	Square Yards	B-Grade GCL Layer
8)				CONSTRUCT REPOSITORY LEACHATE COLLECTION
	170	170	Lineal Feet	Leachate Collection PVC Pipe
	98	98	Lineal Feet	Leachate Transmission PVC Pipe
	7,450	7,450	Square Yards	Geocomposite
	163	163	Cubic Yards (D. Q.)	Evaporation Pond Excavation
	86	86	Square Yards	Evaporation Pond Liner (GCL)
	1	1	Lump Sum	Polyethylene Sampling Barrel (55-gallon capacity)
	1	0	Lump Sum	Riprap Outfall
	56	56	Cubic Yards (D. Q.)	Apply and Grade Evaporation Pond Cover Soil
9)	1	1	Lump Sum	BUILDING DEMOLITION/DISPOSAL
10)	18,300	18,300	Cubic Yards (D. Q.)	EXCAVATE TAILINGS AND WR5, HAUL, LOAD REPOSITORY
11)	7,450	6,875	Square Yards	<u>CONSTRUCT REPOSITORY CAP</u> GCL
	7,450	6,875	Square Yards	Geocomposite
	4,840	4,840	Cubic Yards (D. Q.)	Apply and Grade Cover Soil (2 ft. minimum depth)
12)	1	1	Lump Sum	CONSTRUCT ADIT DISCHARGE FRENCH DRAIN
13)	9,770	9,770	Cubic Yards (D. Q.)	BACKFILL AND GRADE TP1 and WR5 EXCAVATIONS
14)	525	525	Lineal Feet	<u>RECONSTRUCT STREAM CHANNEL</u> Reconstruct Stream Channel Adjacent to WR5
	25	20	Each	Additional Stream Channel Boulder Installation

D.Q. = Design Quantity



**TABLE 4 (cont'd)  
QUANTITIES SUMMARY**

ITEM NO.	ESTIMATED QUANTITY	ACTUAL QUANTITY	UNIT	DESCRIPTION
15)	2.63	2.63	Acre	WASTE ROCK (WR1, WR2, & WR3) GRADING (Pre-Graded Areas)
16)	46.9	82	Tons	LIME APPLICATION
17)	7,100	7,100	Cubic Yards (D. Q.)	COVER SOIL APPLICATION TO GRADED WASTE ROCK
18)				<u>RUNON CONTROL DITCH CONSTRUCTION</u>
	295	280	Lineal Feet	Repository Run-on Diversion
	90	155	Lineal Feet	Repository Runoff Diversion
	230	280	Lineal Feet	Waste Rock Dump Runon Diversion
19)				<u>FERTILIZE AND SEED</u>
	6.2	6.2	Acre (D. Q.)	Fertilize and Drill Seed (Repository cap, TP1, WR5, WR3)
	5.1	5.1	Acre (D. Q.)	Fertilize and Hydroseed (WR1, WR2, and Obliterated Roadways)
20)				<u>MULCH</u>
	6.2	6.2	Acre (D. Q.)	Straw Mulch (Repository Cap, TP1, WR5, WR3)
	5.1	5.1	Acre (D. Q.)	Hydromulch (WR1, WR2, and Obliterated Roadways)
21)	14,050	12,000	Square Yards	INSTALL EROSION CONTROL MAT
22)	6,650	6,680	Lineal Feet	CONSTRUCT FENCES
23)	3,200	1,616	Lineal Feet	OBLITERATE AND RECLAIM ROADWAYS
24)				MPDES STORMWATER DISCHARGE PERMIT
	1	1	Lump Sum	Discharge Permit
	200	110	Each	Straw Bales
	525	855	Lineal Feet	Silt Fence
C.O. #1				NONPAREIL TAILINGS REMOVAL
	4,490	4,490	Cubic Yards	Excavate Nonpareil Dry Tailings
	630	876	Cubic Yards	Backfill & Grade Nonpareil Area
	1.2	1.2	Acre	Fertilize and Drill Seed
	1.2	1.2	Acre	Straw Mulch Nonpareil area

D.Q. = Design Quantity

The total engineering cost for this project was \$236,380. It cost \$52,131 to prepare the Work Plan, Field Sampling Plan, and other supporting documents for both the Brooklyn and Nonpareil Sites. The reclamation investigation and risk assessment for the Brooklyn and Nonpareil Sites cost \$57,217. Preparation of the Expanded Engineering Evaluation/Cost Analysis for the Brooklyn Site cost \$34,600. Engineering design and bid specification preparation cost \$42,372. Construction management including engineering administration and inspection cost \$50,060. Construction of the Boulder Creek Stream Diversion Structure cost \$25,441.

Costs associated with work plan preparation and site characterization are higher than typically expected due the inclusion of the Nonpareil Site during this phase of the project.

An analysis of the engineering costs verses construction costs is presented in Appendix G. The total project cost was \$1,029,717.

## **6.0 PROJECT SUMMARY**

### **6.1 SUMMARY OF THE PROJECT**

The project went as scheduled with few modifications. The primary change was the removal of dry tailings from the Nonpareil Site for disposal in the Brooklyn Repository and reclamation of the areas from which tailings were removed.

### **6.2 SITE CONDITION AFTER COMPLETION**

The Brooklyn Mine Site has been completely reclaimed and the hazards associated with the site have been mitigated.

### **6.3 MAINTENANCE OR FOLLOW-UP**

The site will be checked in the spring of 1996 and periodically thereafter for revegetation success. The USFS has committed to an aggressive program to obliterate spotted knapweed that was present on the site prior to reclamation construction.

Additional planting of riparian vegetation, shrubs, and trees will be conducted in the spring of 1996.

The USFS has also committed to monitoring stream water quality above and below the site and the leachate from the repository.

### **6.4 CONSTRUCTION BID PACKAGE**

Copies of the site plan drawings which were provided in the bid package are located in Appendix H. These site plan drawings represent the reclamation engineering design (the plans from which the contractor bid the work and constructed the project).

## 6.5 AS-BUILT DRAWINGS

As-Built drawings are located in Appendix I.

## 7.0 COMMENTS/SUGGESTIONS

The Brooklyn Mine Reclamation Project was completed on schedule and within the engineer's cost estimate. All project objectives were met as specified. The following suggestions are intended to help prevent minor problems from recurring on future projects.

The Brooklyn project contract contained one critical milestone date. All WR5 removal and stream reconstruction activities had to be completed by September 15, 1995, in order to comply with the terms of the 124 permit. The bid specifications stated that this work must be completed by September 15, 1995, but there was no penalty if this date was not met. The possibility of writing stipulated penalties on intermediate contract dates into the contract to help motivate contractors to meet these types of deadlines should be evaluated.

The MDEQ/AMRB contract should require that signed copies of the contractor's daily log sheets be provided to the inspector on a daily basis to circumvent the potential for differing interpretations of the daily activities.

Stormwater/temporary erosion control standard specifications need to be improved. Standard drawings are necessary. A requirement that the contractor have someone on-site during precipitation events to maintain BMP's is also necessary. The contractor must have an adequate supply of temporary erosion control materials on-site prior to breaking ground. The weed-free certification requirement for straw bales used for temporary erosion control was not included in the standard language in the specifications package -- this requirement is imperative. In addition, the substitution certified weed-free hay grass bales for certified straw allows the possible introduction of undesirable non-native perineal grass species such as timothy and crested wheat grass. Requiring that the contractor identify a source and procure straw, and making it clear the hay grass substitutions will not be allowed should mitigate this problem.

A Bid Item for run-on/run-off ditches as needed with a standard specification would be helpful. The standard boiler plate storm water language currently in the specifications implies that additional ditches may be required and should be considered incidental. This may not be very fair to the contractor in complex drainage areas.

Pioneer needs to better classify excavation/borrow after a final repository location is selected, for design purposes so that the design engineer can anticipate potential problems and design accordingly. This will require a small amount of additional field work following the EEE/CA (approximately six test pits per acre). The USFS and MDT have suggested that this data should not be provided in the bid package or to the prospective contractors and that work of this type



should be described simply as "Unclassified Excavation" or "Unclassified Borrow." This may result in bidding higher unit prices, but may balance out in the end by negating any potential for change of condition claims.

Pioneer provided the contractor with consolidation boundary stakes and preliminary cut/fill stakes for the waste rock dumps to be graded out. These stakes did not seem to help the operators and promoted some confusion on the steep grades. Specifying the target slopes and outlining the approximate consolidation boundaries on the plans should supply the contractors with sufficient information to conduct the work.

The GCL specified for the repository was versatile and relatively easy to install. The second layer of GCL on the bottom of the repository specified to mitigate potential chemical compatibility problems was more difficult to install. Alternatives to this approach such as a light synthetic liner should be evaluated in the future.

The "Design Quantity" classification worked very well on the tailings and waste rock excavation bid items as well as the reclamation area bid items. The only conflict resulted from absence of bank and loose designations from the quantities in the bid package. Excavation volumes should be labeled as bank in the plans to avoid claims.

Testing for liming requirements following the grading of dumps was very important to the final product. Waste rock dumps are extremely heterogeneous in nature, making it nearly impossible to characterize the entire contents during the investigation stage of a project.

Liming requirements will be better characterized in the future. Pioneer falsely assumed that average values determined from the investigation would be adequate. Testing after regrading indicated scattered hot spots. The liming rate had to be increased to neutralize the hot spots even though the average rate was lower than specified.

The specification used by Pioneer for organic amendment of soil was lacking in detail. The contractor spent considerable effort trying to find an acceptable "equal" and became frustrated that Pioneer repeatedly turned down his requests based on parameters that were not detailed in the specifications. In the future, Pioneer's specifications will include an acceptable range for the carbon to nitrogen ratio, organic carbon content, allowable metals content, physical parameters, and a weed seed free specification. Additional pre-approved sources may also be helpful.

Compost analyses performed during construction included moisture content on the compost and organic carbon content on the mixed soil. The moisture contents were necessary to verify that the volume of compost supplied to the contractor by Eko-Compost of Missoula corresponded to the dry weight Pioneer specified. Compost moisture contents increased by several percentage points following rain events. The organic carbon content analysis was necessary to verify that the compost mix ratio was adequate and that mixing was consistent. A possible modification to Pioneer's specification would be to specify the target organic content of the mixed soil and give

an approximate dry weight and volume of compost plus the approximate mix ratio to accomplish this the target organic content. This approach would negate the need for conducting moisture content analyses.

The contractor had difficulties obtaining some of the specified native species seeds. Pioneer contacted seed companies prior to finalizing the Bid Package to make sure that seed was available, but by the time the contractor placed an order, some species were sold out. MDEQ/AMRB may want to require that seed is ordered within 10 days following notice to proceed.

Revision of the temporary fence specification provided by the USFS is recommended to make the fence more economical and constructable.

The MDEQ/Air Quality Bureau recently began enforcing a law requiring a permit for burning of all demolition debris. When necessary, the burning permit should be obtained in advance of letting the project, due to the long public comment period required.

Either the contractor or engineer should be required to provide useable communications (cellular or radio phones) on remote project sites. Many difficulties that occurred during the first two weeks of the project could have been easily resolved if there had been a phone on-site.

## **8.0 PHOTOGRAPHS/SLIDES**

The photographs taken to document the work performed are included in Appendix J. The description of each photograph is included on each photo.





## **APPENDIX A**

### **PRE-BID CONFERENCE MEETING MINUTES**



July 14, 1995

MEMORANDUM

TO: Brooklyn Mine Reclamation Plan Holders

FROM: Jack Yates, Reclamation Specialist  
Abandoned Mine Reclamation Bureau

RE: Pre-Bid Meeting Minutes/Plan Questions

The Pre-Bid meeting for the Brooklyn Mine Reclamation Project was held on Tuesday, July 11, 1995 at 1:00 p.m. at the Brooklyn Mine Site. All meeting participants were given a copy of the Engineer's Preferred Equipment List (see attached). Participants then filled out the meeting attendance list (see attached). Jack Yates representing the Department of Environmental Quality (DEQ-AMRB) began the meeting by introducing members of Pioneer Technical Services, Inc., (Project Engineer), which included: Bill Bullock, Brad Archibald, Dawn Clark and Darla Haberman. Jack then introduced the U.S. Forest Service representative, Bob Wintergerst.

Jack described the funding of the project and the fact that the project was a joint cooperative effort between DEQ-AMRB and the U.S.F.S. Philipsburg Ranger District. Jack discussed general DEQ-AMRB contract policy and procedure by going through relevant sections in the Project Bid Package. Jack reminded contractors of several differences in this bid package from others the AMRB had produced in the past. These include:

- 1). No public contractor's license is required to bid on this project.
- 2). Pollution Prevention Liability Insurance in the amount of \$1,000,000 will be required to bid on this project.
- 3). A written proposal will be required to bid on this project (see Section II, page II-6 of bid package).
- 4). Contractor's were reminded that there will be no final surveys done for any bid item based on Design Quantity (D.Q.) measurement. These items will be paid based on





the D.Q. listed in the bid package. If contractor feels that there is more or less material than the D.Q., then it is the contractor's responsibility to adjust the unit price bid up or down to cover his/her costs on the item.

- 5). Contractor's were reminded to pay close attention to all of the measurement and payment methods and to bid accordingly.

The meeting was then turned over to Bob Wintergerst to address U.S.F.S. concerns during site reclamation. Bob identified the following concerns:

- 1). It will be the contractor's responsibility to protect and preserve all cultural resources as identified by the U.S.F.S. archaeologist. These resources consist of cabins, certain can dumps, a mine entrance structure and the water wheel structure and were identified in the field by Bob during the site tour.
- 2). The contractor may camp on the site with a limited number of employees and campsites.
- 3). The roads through the site are public and will be kept open and accessible during project construction. Short-term temporary closures may be possible if necessary for construction and haulage purposes.

The meeting was then turned over to Bill Bullock, the Project Engineer, who provided the technical presentation and individual site feature tour. Bill's discussions were guided by a prepared Pre-Bid Outline (see attached).

During the technical presentation and site tour, the following contractor questions were fielded by DEQ-AMRB, U.S.F.S. and Pioneer Technical Services:

#### GENERAL STATEMENTS:

1. Cory Claussen from Roscoe Steel said that the geocomposite material (geonet and filter fabric) would take 30 days or more to get.

Brad Archibald from Pioneer replied that if that is the case, then he would look into having the geonet not bonded. The project should be bid using geocomposite; however, separate geonet and filter fabric may be used if necessary to meet the project schedule.

#### GENERAL QUESTIONS AND ANSWERS:

- Q. How can there be out of state preference when it is Forest Service land?
- A. Out of state preference means adding a percentage to a contractor's bid if the state he works from adds a percentage to Montana bidders when they bid in his state. (Jack Yates)
- Q. How is compost mixed with the soil?
- A. It is outlined in the Technical Specifications, Section 4.5. (Bill Bullock)
- Q. Can contractor salvage steel on-site?
- A. Yes, with Engineers approval. (Jack Yates)
- Q. Includes steel in dumps?
- A. Yes, other than possible artifacts. (Jack Yates)
- Q. According to the Technical Specifications, if historical artifacts are found, they have to be left alone for an archeologist to look at them. What if there is delay time?
- A. We will work with you; if there is some delay we will make an adjustment in the contract time. (Jack Yates)
- Q. Should wood debris be segregated for burning?
- A. Either stockpiled out of the way or burned in small piles. (Bob Wintergerst)
- Q. What permits will the Contractor be responsible for obtaining?
- A. It is up to the Contractor to get a burning permit from the Forest Service and MPDES Stormwater Discharge Permit. We will send in for the Beneficial Use Permit for construction water. (Jack Yates)
- Q. What about the access over load limit bridges? The first bridge has a 10 ton limit.
- A. That will have to be checked. (Bob Wintergerst)
- Q. Is there a description of the sites? A specific place to discuss construction techniques in the proposal/bid?
- A. The proposal sheet lists sections. Proposal refers to Brooklyn site, not individual (WR-5, repository, etc.) descriptions. (Jack Yates)
- Q. Does the sequence of events listed in the proposal have to be followed or can the contractor work on several at a time?
- A. No, if the Contractor has a big crew, that's great. (Bill Bullock)
- Q. Is the site restricted to the open public?
- A. Working boundaries can be closed, but the roads are open to the public. (Bob Wintergerst)



- Q. Weeds?
- A. Forest Service takes care of weeds. (Jack Yates)
- Q. Do we need to notify someone if we want to come to the site on weekends?
- A. No. (Bill Bullock)

SUBSECTION 2.2, CONTRACTOR QUALIFICATIONS AND PROPOSED PROJECT APPROACH:

- Q. Is this written after getting the job?
- A. No, has to be completed and sent with the bid. (Jack Yates)
- Q. How is this evaluated and what bearing does it have on the award?
- A. It let's us know the approach the contractor will take and who is thinking about the project. (Jack Yates)
- Q. Low bid is not essential?
- A. It is very important; award is based on bid, proposal, and qualifications. (Jack Yates)

WR-5:

- Q. The gate on the road to WR-5 will have to be removed; does it need to be replaced?
- A. No, the road will eventually be closed off by the Forest Service. (Bob Wintergerst)
- Q. Do the quantities for the repository take into consideration the material from the road?
- A. Road excavation material will be used as backfill in the tailings and WR-5 excavation. (Bill Bullock)
- Q. What is the final status on the road?
- A. It will be left in place for future maintenance, but will eventually be closed off by the Forest Service. (Bob Wintergerst)
- Q. Is the stream diversion awaiting construction of the road?
- A. No, the Montana Conservation Corps will be coming in to construct the stream diversion and it will be in place before construction of the road begins. (Bill Bullock)
- Q. Is the CMP from the diversion structure stockpiled or hauled to Helena.
- A. The CMP shall be hauled to Helena to the Central Lands office. (Jack Yates)
- Q. When should the CMP be hauled?
- A. Prior to project closeout. (Bill Bullock)

- Q. What happens if the diversion is flooded?  
A. There will be a Change Order if that happens, but the contractor will not be responsible for that. (Bill Bullock)

#### TAILINGS POND:

- Q. Was the volume of underlying soil to be excavated considered for the repository?  
A. Yes, yardage was considered. (Bill Bullock)
- Q. How many yards in the area?  
A. 4,900 cubic yards. (Bill Bullock)
- Q. Will there be post-(sampling) of what is remaining?  
A. No, visual. (Bill Bullock)
- Q. Will excavation areas be flagged?  
A. Yes, the engineer will conduct all staking. (Jack Yates)
- Q. Are there compaction requirements?  
A. Repository is the only place that has compaction requirements. (Brad Archibald)
- Q. Proctors?  
A. Engineer will be responsible for proctors and neutron probe testing. (Brad Archibald)
- Q. Is there a buffer of vegetation that needs to be left?  
A. Not at the tailings excavation access area; the repository has 20 feet buffer of trees. (Bill Bullock)

#### REPOSITORY:

- Q. Why do workers have to be 40-hour trained for clearing on the repository?  
A. Workers clearing on the repository may be an exception, but any workers dealing with mine waste must be 40-hour trained. (Bill Bullock)
- Q. Will there be corner stakes for the repository?  
A. There will be corner, center, and off-set stakes. (Brad Archibald)
- Q. What swell factor was assumed for waste?  
A. Net swell of 3%. Brad Archibald)
- Q. If bonded geonet is not available, will seams be sewn?  
A. Sewn or tied. (Brad Archibald)
- Q. What do you mean when you say "off-spec liner"?  
A. The "B-roll" or "off-spec" GCL is defined in the Technical Specifications. (Brad Archibald)

## ENGINEER'S PREFERRED EQUIPMENT LIST

- ▶ 3 - 25 or 35 ton Articulating Haul Trucks;
- ▶ Cat 235 Excavator (or equal);
- ▶ 2 - Cat 966 Loaders (or equal);  
(one loader equipped to deploy geosynthetic material)
- ▶ Cat D-8 Dozer with rippers;
- ▶ Cat D-4 or D-5 Dozer with wide tracks and low center of gravity;
- ▶ Water Truck;
- ▶ Adapted farming equipment;
- ▶ Sheepsfoot Vibratory Roller;
- ▶ Smooth Drum Vibratory Roller; and
- ▶ Motor Grader.



NAMES OF PERSONS ATTENDING

- ☐ PUBLIC MEETING  
☒ PREBID CONFERENCE  
☐ PRECONSTRUCTION CONFERENCE

FOR THE BROOKLYN MINE RECLAMATION PROJECT  
GRANITE COUNTY, MT - DSL-AMRB #94-007

DATE: July 11, 1995 TIME: 1:00 p.m.

Name	Address	Affiliation	Telephone Number
Jack Yates	1625 11th Ave., Helena	Dept. of Environ. Quality	444-2074
<del>1111</del> <u>Joe Alford</u>	<u>42021 S 1st</u>	<u>H. L. L. L. L.</u>	<u>538-9511</u>
<u>Joe Alford</u>	<u>P.O. Box 1442 Great Falls</u>	<u>Shumaker, T. K. &amp; Co.</u>	<u>727-3537 FAX 727-9995</u>
<u>Ann Harris</u>	<u>P.O. Box 1338 Great Falls</u>	<u>Hydrometallurgical</u>	<u>227-3341</u>
<u>Bob Cook</u>	<u>1050 N. 1st St. Great Falls</u>	<u>Hydrometallurgical</u>	<u>208-3341</u>
<u>Cory W. Galt</u>	<u>5105 MOUNT RD</u>	<u>BOSS OF STEEL</u>	<u>(406) 542-0345</u>
<u>Andy Johnson</u>	<u>P.O. Box 710 Missoula</u>	<u>ATL GROUP</u>	<u>406-543-8218</u>
<u>Pat Walters</u>	<u>c/o FBI Box 45, Wallace, ID.</u>	<u>ERMW, Bldg, mt.</u>	<u>406-223-8143 208-556-1111 FAX 208-752-0461</u>
<u>George M. Mungas</u>	<u>108 Sawtooth Phillipsburg</u>	<u>Mungas Co. Inc.</u>	<u>206-859-3803</u>
<u>Jack Martin</u>	<u>3426 Hwy 12 E.</u>	<u>Helena MT 59714</u>	<u>406-443-6466</u>
<u>Bob Winterfest</u>	<u>Box 11 Phillipsburg</u>	<u>U.S. Forest Service</u>	<u>406-859-3211</u>
<u>Jack McLaughlin</u>	<u>Box 237 Phillipsburg</u>	<u>ERMW, Bldg</u>	<u>406 729-8213</u>

## NAMES OF PERSONS ATTENDING

- ☐ PUBLIC MEETING  
☒ PREBID CONFERENCE  
☐ PRECONSTRUCTION CONFERENCE

FOR THE BROOKLYN MINE RECLAMATION PROJECT  
GRANITE COUNTY, MT - DSL-AMRB #94-007

DATE: July 11, 1995      TIME: 1:00 p.m.

Name	Address	Affiliation	Telephone Number
Jack Yates	1625 11th Ave., Helena	Dept. of Environ. Quality	444-2074
Bill Bullock	P.O. Box 3445, Butte	Pioneer Technical	782-5177
Brad Archibald	P.O. Box 3445, Butte	Pioneer Technical	782-5177
Dawn Clark	P.O. Box 3445, Butte	Pioneer Technical	782-5177
Darla Haberman	P.O. Box 3445, Butte	Pioneer Technical	782-5177
John Montgomery	Box 813, Hilger, MT	Montgomery Construction	538-9811
Joe Aline	P.O. Box 1442, Great Falls, MT	Shumaker Trucking Inc.	727-3537
Don Davis	P.O. Box 1338, East Helena, MT	Hydrometrics, Inc.	227-3341
Bob Cook	143 E. Mallont, Drummond, MT	Parke Logging	288-3265
Cory Claussen	5405 Momont Road	Roscoe Steel	542-0345
Andy Mathison	P.O. Box 790, Missoula, MT	JTL Group	543-8218
Pat Walters	c/o ERI Box 45, Wallace, ID 83873	ERNW, Butte, MT	208-556-1111

☐ PUBLIC MEETING  
☒ PREBID CONFERENCE  
☐ PRECONSTRUCTION CONFERENCE

DATE: July 11, 1995 TIME: 1:00 p.m.

[illegible]



## BROOKLYN PRE-BID OUTLINE

### I. INTRODUCTION - Jack

MDEQ/AMRB PROGRAM DESCRIPTION  
ROLES AND RESPONSIBILITIES  
PROJECT OBJECTIVES

### II. USFS INTRO - Bob

USFS ROLE  
HISTORIC/CULTURAL RESOURCES  
ROADS AND CAMPING

### III. TECHNICAL PRESENTATION - Bill & Brad

#### 1. GENERAL

HAZARDOUS MATERIAL-OSHA TRAINING  
POLLUTION PREVENTION LIABILITY INSURANCE  
DESIGN QUANTITIES  
IN-STREAM WORK COMPLETED BY SEPTEMBER 15

(Note-tour presentation does not necessarily follow order of work)

2. WR5 HAUL ROAD IMPROVEMENT- cut down 2 to 4 feet to a width of 16 feet and construct a berm. SOME BLASTING MAY BE NECESSARY. Cut material from top part of road will be used as fill in the tailings excavation area and cut from the bottom used as fill in the WR5 Excavation
3. WR5 EXCAVATION - excavate 13,400 cubic yards of tailings and haul to the repository site. Debris removal. Stream protection - a diversion will be constructed prior to start of work. Contractor will install silt fence along the border of the excavation as an additional safety measure. If water is encountered in the excavation, a series of temporary settling ponds will be necessary as the excavation proceeds upstream. One pool contains significant waste rock and will be excavated as well
4. ADIT DISCHARGE FRENCH DRAIN CONSTRUCTION - approx 30 tons of high quality limestone in a trench lined with filter fabric.
5. BACKFILL EXCAVATION AREA - fill from road and amended soil excavated from the repository. Fill depth will average 3' deep.
6. STREAM RECONSTRUCTION - grade in bank as instructed, seed and fertilize along the bank, install erosion control blanket and rock, install large boulders to

form step pools (boulder source-repository excavation and down the road), stream diversion structure will be removed while placing boulders. (Note-there may be quite a bit of fine adjustment associated with this task), crimp straw into the rest of the area below ASAP. **Reiterate that stream work must be completed by September 15.**

7. TAILINGS EXCAVATION - 4,900 cubic yards of tailings and underlying soils excavated. Clear and grub of 1.4 acres on the upper (south end) and scraping up of spilled tailings.
8. TAILINGS AREA BACKFILLING - road cut material in bottom and 2 feet of amended cover soil over the entire area.
9. REPOSITORY CONSTRUCTION AND CAPPING - Brad
10. WASTE ROCK GRADING - graded to minimize slope steepness and consolidate area. When possible waste is pushed from top to bottom but some uphill pushing or hauling will be required on WR3 and WR1. (Note the 2' tolerance on the drawing- giving the contractor some flexibility) Road access is shown on plans, benches or intermediate access shall be incidental to this task.
11. WASTE ROCK LIMING - rates may change a little - surface will be gridded and sampled following grading to verify accuracy of design values.
12. SEEDING AND MULCHING - show up on site with equipment or a subcontractor prepared to (and experienced at) work on very steep slopes. Straw crimping and drilling on slopes of 2.5:1 or flatter and hydroseed and erosion control mat on the steeper slopes.

Q. Is there a specification for the backfill in the anchor trenches?  
A. No, excavated material will be adequate due to the 4:1 side slopes. (Brad Archibald)

Q. Is it all right for the initial lift to be 2 feet?  
A. There will not be much attention paid to the compaction first lift; once the GCL is down and it is important to get it covered with a uniform lift fast. We do not have enough tailings materials to make the first lift 2 feet, however. (Brad Archibald)

Q. Cover soil out of repository is 15,200, but when you add all the design quantities for waste rock and tailings, there is more than that.

A. There is a 20% swell. All cover soil is applied loose. Contingency to adjust; will not go off-site for borrow. (Brad Archibald)

Q. Repository clearing slash will be difficult to handle - left on-site to burn?

A. Leave on-site for Forest Service to burn. (Bob Wintergerst)

Q. Will a Change Order be given to blast in the repository excavation, if necessary?

A. Possible. (Jack Yates)

WR-2:

Q. Is there some place to turn around at WR-2?

A. Contractor is responsible for making one. (Bill Bullock)

WR-1:

Q. Is the waste from below thrown up here?

A. Yes. (Bill Bullock)

Q. Is the topsoil cascaded from here?

A. Yes. (Bill Bullock)

Q. Is there a Forest Service line (trees marked)?

A. No, incidental trees have to go. (Bob Wintergerst)

INSURANCE POLICY/WARRANTY CLAUSE:

Q. What is the main concern? What could happen?

A. In case of flood event or adit discharge into creek; policy is now standard on all hardrock sites. (Jack Yates)

Q. Are the Contractors limited to that \$1,000,000?

A. That is for the courts to decide; it has not been tested yet. (Jack Yates)



Q. Once a portion is completed, can the insurance be decreased?  
A. Pollution liability is a blanket deal; start to finish.  
(Jack Yates)

Q. What about the warranty clause?  
A. Warranty clause is 1 year and is different from Pollution Liability. One year warranty period covers construction failures attributable to the Project Contractor. (Jack Yates).

Two addendums were discussed at the meeting, one relating to where the stream re-routing pipe would be delivered to, and one relating to the bonding of the repository area geocomposite fabric due to a 30 day supplier backorder period. No addendums, however, will be issued for this project. I think it is clear, in the specs, that the stream re-routing pipe will be delivered to the Central Lands Office yard located at 8001 North Montana Avenue, Helena, Montana. This pipe may be temporarily stockpiled on-site, however, before the contractor completes and leaves the site, this pipe is to be delivered to the above address. Cory Claussen, of Roscoe Steel, advised us that delivery times on geocomposite were at 30 to 60 days. Bill stated that separate material (individual filter fabric and geonet) could be allowed if it would save delivery time. After the meeting, Cory checked with his suppliers; both the geocomposite and the individual materials would take approximately 30 days to receive delivery. No time is saved by ordering the materials separately (at least from Cory's suppliers). Therefore, geocomposite materials should be used. If the geocomposite does not arrive on-site before the contractor is ready to load the repository with waste from dump #5, the material may have to be double handled. The time and cost of any double handling necessary will be the responsibility of the contractor.

Following the meeting, Bob Wintergerst (U.S.F.S.), checked into the bridge load limit concern. He has not yet gotten a definite answer, but we have found out that a stream crossing permit can be obtained as a last resort.

## **APPENDIX B**

### **BID TABULATIONS**





BROOKLYN MINE RECLAMATION PROJECT  
GRANITE COUNTY, MONTANA

DSL/AMRB 94-007  
July 20, 1995

BID TABULATIONS				ENGINEER'S ESTIMATE		ENVIRONMENTAL RECLAMATION NORTHWEST		MUNGAS CONSTRUCTION		MONTGOMERY CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price						
1.	1	LS	Mobilization, bonding, insurance	110,000.00	110,000.00	97900.00	97,900.00	139,000.00	139,000.00	140,000.00	140,000.00
2.	680	LF	Access road improvements	45.00	30,600.00	12.06	8,200.80	44.12	30,001.60	10.00	6,800.00
3.	1	LS	Clearing and grubbin, including timber harvest	25,000.00	25,000.00	12,000.00	12,000.00	8,250.00	8,250.00	16,200.00	16,200.00
4.	15,200	CY	Repository excavation	2.75	41,800.00	2.07	31,464.00	5.00	76,000.00	2.00	30,400.00
5.	610	Tons	Organic amendment	50.00	30,500.00	135.75	82,807.50	164.26	100,198.60	150.00	91,500.00
6.	7450	SY	Prepare repository subgrade	1.00	7,450.00	.40	2,980.00	.15	1,117.50	1.50	11,175.00
7.	7450	SY	GCL Bottom Liner	5.50	40,975.00	4.92	36,654.00	4.35	32,407.50	6.00	44,700.00
	3120	SQ	B grade GCL layer	3.50	10,920.00	4.94	15,412.80	3.82	11,918.40	6.50	20,280.00
8.	170	LF	Leachate collection PVC Pipe	10.00	1,700.00	9.00	1,530.00	5.92	1,006.40	8.00	1,360.00
	98	LF	Leachate Transmission PVC Pipe	10.00	980.00	14.00	1,372.00	5.92	580.16	8.00	784.00
	7450	SQ	Geocomposite	5.50	40,975.00	4.74	35,313.00	4.75	35,387.50	8.00	59,600.00
	163	CY	Evaporation Pond Excavation	15.00	2,445.00	2.82	459.66	6.15	1,002.45	8.00	1,304.00
	86	SQ	Evaporation Pond Liner (GCL)	10.00	860.00	8.24	708.64	19.19	1,650.34	8.00	688.00
	1	LS	Polyethylene Sampling Barrell (55 gal capacity)	200.00	200.00	250.00	250.00	1000.00	1,000.00	400.00	400.00
	1	LS	Riprap Outfall	500.00	500.00	500.00	500.00	100.00	100.00	500.00	500.00



BID TABULATIONS					ENGINEER'S ESTIMATE		ENVIRONMENTAL RECLAMATION NORTHWEST		MUNGAS CONSTRUCTION		MONTGOMERY CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price							
	56	CY	Apply and Grade Evaporation Pond cover soil	10.00	560.00	4.82	269.92	17.86	1,000.16	20.00	1,120.00	
9.	1	LS	Building demolition/disposal	3,000.00	3,000.00	1,900.00	1,900.00	9,000.00	9,000.00	2,000.00	2,000.00	
10.	18,300	CY	Excavate tailings and WR5, haul, load repository and compact	6.50	118,950.00	5.73	104,859.00	9.50	173,850.00	5.00	91,500.00	
11.	7,450	SQ	GCL	5.00	37,250.00	4.34	32,333.00	4.35	32,407.50	7.00	52,150.00	
	7,450	SQ	Composite	5.50	40,975.00	4.30	32,035.00	4.22	31,439.00	8.00	59,600.00	
	4,840	CY	Apply and grade cover soil (2 foot minimum depth)	2.75	13,310.00	2.79	13,503.60	2.07	10,018.80	10.00	48,400.00	
12.	1	LS	Construct adit discharge French drain	2,000.00	2,000.00	1,650.00	1,650.00	2,282.50	2,282.50	3,500.00	3,500.00	
13.	9,770	CY	Backfill and grade TPI and WR5 excavations	5.00	48,850.00	2.02	19,735.40	3.36	32,827.20	5.00	48,850.00	
14.	525	LF	Reconstruct stream channel adjacent to WR5	28.00	14,700.00	22.23	11,670.75	29.65	15,566.25	11.43	6,000.75	
	25	EA	Additional Stream channel boulder installation	15.00	375.00	234.00	5,850.00	120.00	3,000.00	50.00	1,250.00	
15.	2.63	Acre	Waste rock grading	10,000.00	26,300.00	9,258.56	24,350.01	5,551.33	14,600.00	13,117.87	34,500.00	
16.	46.9	Tons	Lime application	300.00	14,070.00	187.57	8,797.03	317.06	14,870.11	600.00	28,140.00	
17.	7,100	CY	Cover soil application to graded waste rock	6.00	42,600.00	4.21	29,891.00	3.80	26,980.00	5.00	35,500.00	
18.	295	LF	Repository run-on diversion	8.00	2,360.00	4.17	1,230.15	6.28	1,852.60	5.00	1,475.00	
	90	LF	Repository runoff diversion	5.00	450.00	5.20	468.00	3.40	306.00	5.00	450.00	
	230	LF	Waste Rock Dump run-on diversion	10.00	2,300.00	4.17	959.10	3.95	908.50	5.00	1,150.00	





BID TABULATIONS				ENGINEER'S ESTIMATE		ENVIRONMENTAL RECLAMATION NORTHWEST		MUNGAS CONSTRUCTION		MONTGOMERY CONSTRUCTION	
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price						
19.	6.2	Acre	Fertilize and drill seed	1,500.00	9,300.00	2,046.61	12,688.98	1,415.16	8,773.99	2,000.00	12,400.00
	5.1	Acre	Fertilize and hydroseed	2,000.00	10,200.00	3,882.16	19,799.02	3,647.06	18,600.01	3,000.00	15,300.00
20.	6.2	Acre	Straw mulch	500.00	3,100.00	891.13	5,525.01	661.29	4,100.00	500.00	3,100.00
	5.1	Acre	Hydromulch	700.00	3,570.00	1,470.39	7,498.99	1,254.90	6,399.99	1,000.00	5,100.00
21.	14,050	SQ	install erosion control mat	2.75	38,637.50	2.35	33,017.50	2.85	40,042.50	3.00	42,150.00
22.	6,650	LF	Construct Fences	3.00	53,200.00	3.95	26,267.50	4.00	26,600.00	5.54	36,841.00
23.	3,200	LF	Ob literate and reclaim roadways	6.00	19,200.00	1.13	3,616.00	1.60	5,120.00	1.50	4,800.00
24.	1	LS	Discharge Permit	650.00	650.00	650.00	650.00	650.00	650.00	650.00	650.00
	200	Ea	Straw Bales	12.00	2,400.00	6.00	1,200.00	10.00	2,000.00	10.00	2,000.00
	525	LF	Silt Fence	3.00	1,575.00	1.72	903.00	3.00	1,575.00	3.00	1,575.00
THIS ROW CONTAINS FORMULAS FOR ADDING UP THE COLUMNS -- INSERT ROWS ABOVE THIS ONE IF YOU NEED MORE THAN 7 ITEMS					854,787.50		728,220.36		924,390.56		965,192.75

G:\RECLAM\AMRB\BID-TAB.TBL -- SAVE TO DIFFERENT NAME (PROJECT NAME) WHEN USED  
USE SECOND SHEET IF MORE THAN 4 BIDDERS





BROOKLYN MINE RECLAMATION PROJECT  
GRANITE COUNTY, MONTANA

DSL/AMRB 94-007  
July 20, 1995

BID TABULATIONS				ENGINEER'S ESTIMATE		JTL GROUP				
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price					
1.	1	LS	Mobilization, bonding, insurance	110,000.00	110,000.00	181,131.50	181,131.50	0.00		0.00
2.	680	LF	Access road improvements	45.00	30,600.00	16.00	10,880.00	0.00		0.00
3.	1	LS	Clearing and grubbin, including timber harvest	25,000.00	25,000.00	15,000.00	15,000.00	0.00		0.00
4.	15,200	CY	Repository excavation	2.75	41,800.00	2.75	41,800.00	0.00		0.00
5.	610	Tons	Organic amendment	50.00	30,500.00	200.00	122,000.00	0.00		0.00
6.	7450	SY	Prepare repository subgrade	1.00	7,450.00	1.00	7,450.00	0.00		0.00
7.	7450	SY	GCL Bottom Liner	5.50	40,975.00	6.75	50,287.50	0.00		0.00
	3120	SQ	B grade GCL layer	3.50	10,920.00	5.00	15,600.00	0.00		0.00
8.	170	LF	Leachate collection PVC Pipe	10.00	1,700.00	10.00	1,700.00	0.00		0.00
	98	LF	Leachate Transmission PVC Pipe	10.00	980.00	24.00	2,352.00	0.00		0.00
	7450	SQ	Geocomposite	5.50	40,975.00	6.50	48,425.00	0.00		0.00
	163	CY	Evaporation Pond Excavation	15.00	2,445.00	12.00	1,956.00	0.00		0.00
	86	SQ	Evaporation Pond Liner (GCL)	10.00	860.00	20.00	1,720.00	0.00		0.00
	1	LS	Polyethylene Sampling Barrell (55 gal capacity)	200.00	200.00	350.00	350.00	0.00		0.00
	1	LS	Riprap Outfall	500.00	500.00	1000.00	1,000.00	0.00		0.00
	56	CY	Apply and Grade Evaporation Pond cover soil	10.00	560.00	12.50	700.00	0.00		0.00



BID TABULATIONS					ENGINEER'S ESTIMATE		JTL GROUP			
Item Number	Estimated Quantity	Unit	Description	Unit Price	Total Price					
9.	1	LS	Building demolition/disposal	3,000.00	3,000.00	3,000.00		3,000.00		0.00
10.	18,300	CY	Excavate tailings and WR5, haul, load repository and compact	6.50	118,950.00	6.00		109,800.00		0.00
11.	7,450	SQ	GCL	5.00	37,250.00	6.75		50,287.50		0.00
	7,450	SQ	Composite	5.50	40,975.00	6.50		48,425.00		0.00
	4,840	CY	Apply and grade cover soil (2 foot minimum depth)	2.75	13,310.00	3.00		14,520.00		0.00
12.	1	LS	Construct adit discharge French drain	2,000.00	2,000.00	2,800.00		2,800.00		0.00
13.	9,770	CY	Backfill and grade TP1 and WR5 excavations	5.00	48,850.00	3.50		34,195.00		0.00
14.	525	LF	Reconstruct stream channel adjacent to WR5	28.00	14,700.00	20.00		10,500.00		0.00
	25	EA	Additional Stream channel boulder installation	15.00	375.00	160.00		4,000.00		0.00
15.	2.63	Acre	Waste rock grading	10,000.00	26,300.00	7,300.00		19,199.00		0.00
16.	46.9	Tons	Lime application	300.00	14,070.00	225.00		10,552.50		0.00
17.	7,100	CY	Cover soil application to graded waste rock	6.00	42,600.00	6.50		46,150.00		0.00
18.	295	LF	Repository run-on diversion	8.00	2,360.00	13.00		3,835.00		0.00
	90	LF	Repository runoff diversion	5.00	450.00	22.00		1,980.00		0.00
	230	LF	Waste Rock Dump run-on diversion	10.00	2,300.00	14.00		3,220.00		0.00
19.	6.2	Acre	Fertilize and drill seed	1,500.00	9,300.00	1,700.00		10,540.00		0.00





BID TABULATIONS					ENGINEER'S ESTIMATE		JTL GROUP				
Item Number	Estimated Quantity	Unit	Description		Unit Price	Total Price					
	5.1	Acre	Fertilize and hydroseed		2,000.00	10,200.00	4,290.00	21,879.00	0.00		0.00
20.	6.2	Acre	Straw mulch		500.00	3,100.00	775.00	4,805.00	0.00		0.00
	5.1	Acre	Hydromulch		700.00	3,570.00	1,475.00	7,522.50	0.00		0.00
21.	14,050	SQ	install erosion control mat		2.75	38,637.50	3.50	49,175.00	0.00		0.00
22.	6,650	LF	Construct Fences		8.00	53,200.00	6.50	43,225.00	0.00		0.00
23.	3,200	LF	Obliterate and reclaim roadways		8.00	19,200.00	10.00	32,000.00	0.00		0.00
24.	1	LS	Discharge Permit		650.00	650.00	650.00	650.00	0.00		0.00
	200	Ea	Straw Bales		12.00	2,400.00	7.75	1,550.00	0.00		0.00
	525	LF	Silt Fence		8.00	1,575.00	3.50	1,837.50	0.00		0.00
THIS ROW CONTAINS FORMULAS FOR ADDING UP THE COLUMNS -- INSERT ROWS ABOVE THIS ONE IF YOU NEED MORE THAN 7 ITEMS					156,646.75	854,787.50		1,038,000.00	0.00		0.00

G:\RECLAM\AMR\BID-TAB.TBL -- SAVE TO DIFFERENT NAME (PROJECT NAME) WHEN USED  
USE SECOND SHEET IF MORE THAN 4 BIDDERS





## **APPENDIX C**

### **PRE-CONSTRUCTION CONFERENCE MEETING MINUTES**



DEPARTMENT OF ENVIRONMENTAL QUALITY  
RECLAMATION DIVISION



MARC RACICOT, GOVERNOR

1625 ELEVENTH AVENUE

STATE OF MONTANA

(406) 444-2074  
FAX (406) 444-1923

PO BOX 201601  
HELENA, MONTANA 59620-1601

August 2, 1995

MEMORANDUM

TO: Brooklyn Mine Reclamation File

FROM: Jack Yates, Reclamation Specialist  
Abandoned Mine Reclamation Bureau *JY*

RE: Pre-Construction Meeting Minutes

The Pre-Construction meeting for the Brooklyn Mine Reclamation Project was held on Monday, July 31, 1995 at 10:30 p.m. at the Brooklyn Mine Site (see attendance list attached). Jack Yates representing the Department of Environmental Quality (DEQ-AMRB) began the meeting by reviewing items outlined on the Pre-Construction Meeting Agenda (see attached).

The meeting was then turned over to Bill Bullock, the Project Engineer and Construction Inspector. Bill addressed several engineering topics and informed ERNW that all questions and correspondence regarding the project should be addressed to him. Bill stated that Doug Richmond or Dawn Clark would provide alternative site inspection in his absence. Bill also told ERNW that water use on Boulder Creek would be available through the use of an existing Forest Service water rights permit. Bill also reminded ERNW that weed control on-site is an important issue and that the Forest Service will be developing a post-reclamation weed control plan.

Bill and Jack then addressed the following questions from ERNW:

Q: Can we bill DEQ-AMRB in two week intervals?  
A: Yes. (Jack Yates)

Q: There seems to be a difference in waste dump volumes. The Special Provisions section does not agree with the yardages shown on the plan sheets; there seems to be differing cubic yard figures for the same dumps?

A: ERNW is correct, the Special Provisions section gives a total estimated yardage for all three waste dumps of 11,500 cubic yards, while the yardage shown on the maps is 16,950 cubic yards. I have evaluated this situation with Bill

Bullock have made the following decision. There will be no adjustment of contract price due to the following factors:

1. The yardage estimates were included **only** as an aid for the contractor in determining rough amounts of material to be moved.
2. Maps of the waste dumps were also included to allow the contractor to easily calculate his/her own volume estimates.
3. The Proposal and Special Provisions clearly state that the waste dump regrading work will be paid for by the acre of regrading completed (Jack Yates).

Q: What is the seed mix for the obliterated roadways?

A: The same mix as for the rest of the job (Bill Bullock).

Q: Where do we get boulders for stream pools if we do not find enough in the repository area excavation?

A: I will select boulders located along the roadway to the Brooklyn mine that will be acceptable for our use and will ask Bob Wintergerst if we will need a permit to remove them (Bill Bullock).

Q: Can we mix repository material with a grader?

A: We'll see if this will provide an appropriate mix and if not we'll have to try another method (Bill Bullock).

Q: How do we put the GCL (B) layer over the (A) layer according to spec?

A: We'll look in to this problem and work something out (Bill Bullock).

Q: Can we narrow the haulroad to WR5 to 12'?

A: Yes, as long as it is wide enough and contains a berm high enough to permit safe operation of the largest piece of equipment that will be used on it (Jack Yates).

Q: Can we cut into the hillside to get the road width we need?

A: Only in one small area as directed by the engineer. Cutting into the hillside will make the slope more unstable and therefore will not be allowed in most areas (Bill Bullock).

With no further questions, the meeting was ended at 11:45 a.m.

JY/fo

Attachments



# PRECONSTRUCTION CONFERENCE AGENDA

Project: Brooklyn Mine Reclamation Project

Date: July 31, 1995

Time: 10:30 am

Location: Pioneer Technical Services, Butte, Montana

Conducted by: Jack Yates and Bill Bullock

AMRB Representative: Jack Yates

Attendees: *(Sign in on sheet)*

---

## Discussion

---

- **Project Organization:**

DEQ Abandoned Mine Reclamation Bureau: Jack Yates, Project Manager  
1625 11th Avenue, Helena, Montana 59620

Engineer: Bill Bullock, Project Engineer/Project Inspector  
Pioneer Tech. P.O. Box 3445, Butte, 59702

Contractor: Environmental Reclamation NW., P.O. Box  
3809, Butte, Montana 59701

Subcontractors: See Approval of Subcontractor Form

Other representatives: Jim Kambich-ERNW, Tib Costin-ERNW, Kris  
Paffhausen-ERNW, Brian Benson-ERNW,  
Doug Richmond-Pioneer

- **Purpose of Meeting**

- Introduce and designate responsible personnel
- Establish working relationship
- Discuss project requirements

- **Contractor's Tentative Schedule**

- Contract Time Start Date August 2, 1995  
Completion Date September 30, 1995
- Normal Work Week

- **Contractor's Submittals**
  - Construction Schedules
  - Traffic Plan
  - Lime, seed, fertilizer, and mulch certifications (if applicable)
  - Other Technical Specification sections
  - Substitutions
- **Applications for Payment**
  - Review of General Conditions
  - Review of Measurement and Payment
  - Materials on site
- **Specific DEQ Requirements and Procedures**
  - Interim inspections
  - Safety meetings
  - Certified payrolls
- **Critical Work Sequencing**
  - Material ordering and delivery
  - Liming, topsoiling, and seeding (if applicable)
- **Field Decisions, Work Directives, and Change Orders**
  - Review of General Conditions
- **Use of Premises, Storage Areas, Security, Field Office**
- **Contractor's Assignments for Safety and First Aid**
  - Review Safety Standards, Special Provisions
- **Progress Meetings**
- **Inspection and Testing**
  - Review General Conditions
- **Comments by Other Representatives**
  - DEQ Abandoned Mine Reclamation Bureau
  - Others
- **Distribution of Additional Sets of Specifications and Plans to Contractor**

(Note: A copy of Preconstruction Meeting summary to be mailed to all participants.)

**NAMES OF PERSONS ATTENDING**

☐ PUBLIC MEETING

☐ PREBID CONFERENCE

☒ PRECONSTRUCTION CONFERENCE

**FOR THE BROOKLYN MINE RECLAMATION PROJECT**  
**GRANITE COUNTY, MT - DSL-AMRB #94-007**

DATE: August 1, 1995 TIME: 10:30 a.m.

[illegible]





## **APPENDIX D**

### **CHANGE ORDERS**



# WORK DIRECTIVE CHANGE

(Instructions on Reverse Side)

No. 1

PROJECT: NON PAREIL DRY TAILINGS REMOVAL

DATE OF ISSUANCE: Sept. 14, 1995

CONTRACTOR: ERI-NW  
(Name, Address) 220 N. Alaska St.  
Butte, MT 59701

OWNER: MDEQ/AMRB  
1625 Eleventh Avenue  
Helena, Montana 59620

DEQ-AMRB: 94-007

CONTRACT FOR: BROOKLYN MINE RECLAMATION ENGINEER: Pioneer Technical Services, Inc.

You are directed to proceed promptly with the following change(s):

Description: Excavated, haul, and place approximately 4,500 cubic yards of dry mill tailings from the Non Pareil Site to the waste repository at the Brooklyn Mine for the negotiated unit price of \$9.00/cubic yard. Haul and apply 3-inches of cover soil over the excavation area, seed, and mulch; all at the original contract unit costs of \$2.02 per cubic yard for backfill of cover soil, \$2,046.61 per acre for seeding, and \$891.13 per acre for mulching.

Purpose of Work Directive Change:

The purpose of this change is to facilitate economical cleanup of uncontrolled waste sources at the Non Pareil, and provide addition bedding material for the cap liner at the Brooklyn Mine.

Attachments: (list documents supporting change)

If a claim is made that the above change(s) have affected Contract Price or Contract Time, any claim for a Change Order based thereon will involve one of the following methods of determining the effect of the change(s).

Method of determining change in Contract Price:

- ☐ Time and Materials
- ☒ Unit Prices
- ☐ Cost Plus Fixed Fee
- ☐ Other \_\_\_\_\_

Estimated increase in Contract Price: \$46,129. If the change involves an increase, the estimated amount is not to be exceeded without further authorization.

Method of determining change in Contract Time:

- ☐ Contractor's Records
- ☒ Engineer's Records
- ☐ Other \_\_\_\_\_

Estimated increase in Contract Time: five (5) days. If the change involves an increase, the estimated time is not to be exceeded without further authorization.

RECOMMENDED:

By: Will Bull

Engineer

ACCEPTED:

By: Jeri Kamluck

Contractor

AUTHORIZED:

By: Vic R. Anderson

Owner

## **WORK DIRECTIVE CHANGE**

### **INSTRUCTIONS**

---

#### **A. GENERAL INFORMATION**

This document was developed for use in situations involving changes in the Work which, if not processed expeditiously, might delay the Project. These changes are often initiated in the field and may affect the Contract Price or the Contract Time. This is not a Change Order, but only a directive to proceed with Work that may be included in a subsequent Change Order.

For supplemental instructions and minor changes not involving a change in the Contract Price or the Contract Time, a Field Order may be issued.

#### **B. COMPLETING THE WORK DIRECTIVE CHANGE**

Engineer initiates the form, including a description of the items involved and attachments.

Based on conversations between Engineer and Contractor, Engineer completes the following:

**METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT PRICE:** Mark the method to be used in determining the final cost of Work involved and the net effect on the Contract Price. If the change involves an increase in the Contract Price and the estimated amount is approached before the additional or changed work is completed, another Work Directive Change must be issued to change the time or Contractor may stop the changed Work when the estimated time is reached. If the Work Directive Change is not likely to change the Contract Price, the space for estimated increase (decreased) should be marked "Not Applicable".

**METHOD OF DETERMINING CHANGE, IF ANY, IN CONTRACT TIME:** Mark the method to be used in determining the change in Contract Time and the estimated increase or decrease in Contract Time. If the change involves an increase in the Contract Time and the estimated time is approached before additional or changed Work is completed, another Work Directive Change must be issued to change the time or Contractor may stop the changed Work when the estimated time is reached. If the Work Directive Change is not likely to change the Contract Time, the space for estimated increase (decrease) should be marked "Not Applicable".

Once Engineer has completed and signed the form, all copies should be sent to Owner for authorization because Engineer alone does not have authority to authorize changes in Price or time. Once authorized by Owner, a copy should be sent by Engineer to Contractor.

Once the Work covered by this directive is completed for final cost and time determined, Contractor should submit documentation for inclusion in a Change Order.

**THIS IS A DIRECTIVE TO PROCEED WITH A CHANGE THAT MAY AFFECT THE CONTRACT PRICE OR THE CONTRACT TIME. A CHANGE ORDER, IF ANY, SHOULD BE CONSIDERED PROMPTLY.**



RECEIVED

## CHANGE ORDER

OCT 6 1995

DEPT. ENVIRONMENTAL QUALITY

ORDER NO. 1PROJECT TITLE: Brooklyn Mine Reclamation ProjectMONT A/E or DSL-AMRB: 94-007

CONTRACT DATE: August 1, 1995

OWNER: Montana Department of Environmental Quality/Abandoned Mine Reclamation Bureau

CONTRACTOR: Environmental Reclamation Northwest, LLC

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT' LS.	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
1.	Excavate, haul, and place 4,490 cubic yards of dry Non Porell Tailings in the Brooklyn Repository					\$9.00 / cu. yd.	\$40,410.00
2.	Backhaul 630 cubic yards of coversoil (premixed with compost) and spread over the excavation area on a 3-to 6-inch loose lift					\$2.02 / cu. yd.	\$1,272.60
3.	Fertilize and drill seed 1.2 acres disturbed during removal activities					\$2,045.61 / acre	\$2,455.93
4.	Straw mulch 1.2 acres disturbed during removal activities					\$891.13 / acre	\$1,069.36
TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC.							\$45,207.89
OVERHEAD & PROFIT @ _____ %							\$0.00
GRAND TOTAL - THIS CHANGE ORDER							\$45,207.89

Original Contract Price	\$728,223.00
Current Contract Price Adjusted by Previous Change Order	\$728,223.00
Cost this Change Order (+ or -)	+\$45,207.89
New Contract Price including this Change Order	\$773,430.89

The completion date as set forth in the Contract Documents shall be (unchanged, increased, decreased) by 7 calendar days.

The date for completion of all work will be October 6, 1995.

Description and Justification for Change:

1. The dry tailings on the Non Pareil Millsite (AMRB P.A. Number 20-012) present a significant risk to human health and the environment. The tailings are located on Deerlodge National Forest land in close proximity to the Brooklyn Mine. The repository constructed for the Brooklyn Mine Reclamation Project is able to contain the additional volume of tailings from the Non Pareil due higher than expected compaction of Brooklyn waste sources placed in the repository.

SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by \$45,207.89 (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by \$45,207.89 (100% of the Change Order amount).

COUNTERSIGNED BY MONTANA  
RESIDENT AGENT

HOINESS LABAR INSURANCE, INC.

Countersigned by:

*Sylvia Tilzey*  
Montana Resident Agent

SURETY

Amwest Surety Insurance Company

*Sylvia Tilzey*  
By: Sylvia Tilzey, Attorney-in-fact  
Seal

Recommended by:

*Walt / Duhll*, Pioneer Technical Services Inc.  
Engineer

Date

10/2/95

Accepted by:

*Jim Hamlin*, ERNW

Contractor

Date

Approved by:

*Jack D. Yates*

Owner

DEQ-AMRB

10/11/95  
Date

# CHANGE ORDER

ORDER NO. 2

PROJECT TITLE: Brooklyn Mine Reclamation Project

DEQ-AMRB: 94-007

CONTRACT DATE: August 1, 1995

OWNER: Montana Department of Environmental Quality/Abandoned Mine Reclamation Bureau

CONTRACTOR: Environmental Reclamation Northwest, LLC

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment, and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT LS.	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
1.	No nrap outfall was installed at the repository leachate pond.					\$500.00	-\$500.00
2.	Install 6,875 sq. yds. of GCL in repository cap instead of 7,450 sq. yds. estimated.					\$4.34 / sq. yd.	-\$2,495.50
3.	Install 6,875 sq. yds. of Geocomposite in repository cap instead of 7,450 sq. yds. estimated.					\$4.30 / sq. yd.	-\$2,472.50
4.	Install 20 boulders for additional habitat and bank support instead of 25 estimated.					\$234.00 ea.	-\$1,170.00
5.	Apply 82 tons of lime to WR2 and WR3 instead of the 46.9 tons estimated.					\$187.57 / ton	\$6,583.74
6.	Construct 280 feet of repository runoff ditch instead of 295 feet estimated.					\$4.17 / L.F.	-\$62.40
7.	Construct 155 feet of repository runoff ditch instead of 90 feet estimated.					\$5.20 / L.F.	\$338.00
8.	Construct 280 feet of waste rock dump runoff ditch instead of 230 feet estimated.					\$4.17 / L.F.	\$208.60
9.	Install 12,000 sq. yds. of erosion control mat instead of 14,050 sq. yds. estimated					\$2.35 / sq. yd.	-\$4,818.00
10.	Construct 6,680 feet of fences instead of 6,650 feet estimated.					\$3.95 / L.F.	\$118.00
11.	Obliterate and reclaim 1,616 feet of road instead of 3,200 feet estimated.					\$1.13 / L.F.	-\$1,789.92
12.	Install 110 straw bales instead 200 straw bales for temporary erosion control.					\$6.00 ea.	-\$540.00
13.	Install 855 feet of silt fence instead of 525 feet estimated.					\$1.72 / L.F.	\$567.60
14.	Hauled and placed 876 cubic yards of cover soil to the Nonpareil Tailings area instead of 630 cubic yards estimated.					\$2.02 / cu.yd.	\$496.52
TOTAL COST - MATERIALS, LABOR, EQUIPMENT & MISC.							-\$5,535.86
OVERHEAD & PROFIT @ ____ %							\$0.00
GRAND TOTAL - THIS CHANGE ORDER							-\$5,535.86

Original Contract Price  
 Current Contract Price Adjusted by Previous Change Order  
 Cost this Change Order (+ or -)  
 New Contract Price including this Change Order

\$728,223.00  
\$773,430.89  
-\$5,535.86  
\$767,895.03



The completion date as set forth in the Contract Documents shall be (unchanged, increased, decreased) by 0 calendar days.

The date for completion of all work will be October 6, 1995.

Description and Justification for Change:

1. Adjustment for change in actual quantity bid items.

### SURETY CONSENT

The Surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The Principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bonds or Bonds is hereby increased by \$ -5,535.86 (100% of the Change Order amount) and the penalty of the applicable Labor and Material Bond or Bonds is hereby increased by \$ -5,535.86 (100% of the Change Order amount).

COUNTERSIGNED BY MONTANA  
RESIDENT AGENT

SURETY  
Amwest Surety Insurance Company

HOINESS LaBAR INSURANCE, INC.

Countersigned by:

Sylvia A. Tilzey  
Montana Resident Agent

By: Sylvia Tilzey, Attorney-in-fact

Seal

Recommended by:

William J. Budhl  
Engineer

10-16-95  
Date

Accepted by:

James J. Kaminski  
Contractor

10-16-95  
Date

Approved by:

Jack J. Talar  
Owner

10-25-95  
Date



**APPENDIX E**  
**PAYMENT REQUEST FORMS**



RECEIVED  
AUG 22 1995  
DEQ

PAYMENT REQUEST NO. 1

FROM 7-31 TO 8-15

PROJECT TITLE: Brooklyn Mine Reclamation Project

LOCATION: MONT A/E or DSL/AMRB: 94-007

NAME OF CONTRACTOR: Environmental Reclamation Northwest, LLC

ADDRESS: P.O. Box 3809, Butte, Montana 59701

CHANGE ORDERS			CONTRACT STATUS			
No.	Description	Amount	Total Amount	Completed Amount	Uncompleted Amount	Percent Complete
			\$728,223	165,054	563,169	22.67%
TOTAL CHANGE ORDERS						
CONTRACT TO DATE INCLUDING CHANGE ORDERS \$728,223			COMPLETED TO DATE \$165,054			
*For use only when securities are on deposit in lieu of retainage.			PLUS MATERIALS ON SITE \$71,840			
TOTAL RETAINAGE \$			TOTAL COMPLETED TO DATE \$236,894			
SECURITIES ON DEPOSIT \$			LESS RETAINAGE \$23,689			
ADJUSTED RETAINAGE \$			TOTAL AMOUNT EARNED TO DATE \$213,205			
			LESS PREVIOUS PAYMENTS \$			
			AMOUNT DUE THIS PAYMENT \$213,205			
			LESS 1% TAX \$2,132			
			TOTAL DUE CONTRACT \$211,073			

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

Environmental Reclamation Northwest, LLC

Contractor

BY: Jim Kamlich

DATE: 8/18/95

RECOMMENDED BY:

Pioneer Technical Services, Inc.  
Engineer

By Willie D. Smith

Date 8/19/95

Owner

BY: \_\_\_\_\_

DATE: \_\_\_\_\_

RESP. CNTR. 30169

OBJ. EXP. 2121

APPROVAL Vic K. Anderson

DATE 8-25-95

## SCHEDULE OF MATERIAL ON SITE

PROJECT TITLE: Brooklyn Mine Reclamation Project

DSL-AMRB: 94-007

CONTRACTOR: ENVIRONMENTAL RECLAMATION NORTHWEST, LLC

Item <u>7</u>	Material Delivered <u>8-11, 15</u>	
	Material in Place _____	
	Material on Site <u>54 rolls GCL 15' x 125' 11,250 s.y.</u>	<u>\$36,000</u>
Item <u>8c</u>	Material Delivered <u>8-12</u>	
	Material in Place _____	
	Material on Site <u>Geocomposite 42 rolls 8' x 300' 11,200 s.y.</u>	<u>\$35,840</u>
Item _____	Material Delivered _____	
	Material in Place _____	
	Material on Site _____	
Item _____	Material Delivered _____	
	Material in Place _____	
	Material on Site _____	
Item _____	Material Delivered _____	
	Material in Place _____	
	Material on Site _____	
Item _____	Material Delivered _____	
	Material in Place _____	
	Material on Site _____	
	TOTAL MATERIAL ON SITE	<u>\$71,840</u>
	(Attach applicable invoices or bills of lading.)	

Requested by: ENVIRONMENTAL RECLAMATION NORTHWEST, LLC

Contractor

*Jim Kamlich*

To be included in Payment Request No. 1.

Note: Provide invoice.



PAYMENT REQUEST NO. 1 (cont'd)

[illegible]

RECEIVED  
SEP 19 1995  
DEQ

PAYMENT REQUEST NO. 2

RECEIVED

FROM 8/16 TO 8/31

SEP 19 1995

PROJECT TITLE: Brooklyn Mine Reclamation Project

DEQ

LOCATION: MONT A/E or DSL/AMRB: 94-007

NAME OF CONTRACTOR: Environmental Reclamation Northwest, LLC

ADDRESS: P.O. Box 3809, Butte, Montana 59702

CHANGE ORDERS			CONTRACT STATUS			
No.	Description	Amount	Total Amount	Completed Amount	Uncompleted Amount	Percent Complete
			\$728,223	\$458,298	\$263,925	62.93%
TOTAL CHANGE ORDERS						

CONTRACT TO DATE INCLUDING  
CHANGE  
ORDERS  
\$ 728,223

COMPLETED TO DATE

\$ 419,722.00

\*For use only when securities are on deposit in lieu of retainage.

PLUS MATERIALS ON SITE

\$ 38,576.60

TOTAL RETAINAGE \$ \_\_\_\_\_

TOTAL COMPLETED TO DATE

\$ 458,298.60

SECURITIES ON DEPOSIT \$ \_\_\_\_\_

LESS RETAINAGE

\$ 45,829.86

ADJUSTED RETAINAGE \$ \_\_\_\_\_

TOTAL AMOUNT EARNED TO DATE

\$ 412,468.74

LESS PREVIOUS PAYMENTS

\$ 211,073.00

AMOUNT DUE THIS PAYMENT

\$ 201,395.74

LESS 1% TAX

\$ 2,013.96

TOTAL DUE CONTRACT

\$ 199,381.78

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

Environmental Reclamation Northwest, LLC

Contractor

Owner

BY: John Hamrick

BY: \_\_\_\_\_

DATE: 9-5-95

DATE: 9-8-95

RECOMMENDED BY:

Pioneer Technical Services, Inc

Engineer

By: W. H. J. Smith

Date: 9-7-95

RESP. CONTR. 2-2-3600101

APPROVAL: W. H. J. Smith

DATE: 9-8-95

O.K. Jony

## ITEMIZATION OF QUANTITIES AND COSTS

Item	Description	Estimated Plan Quantity	Unit Price Bid	Units of Work Completed To Date	Total Cost of Complete Work	Percent Complete
1	Mobilization	1	97,900	L.S	\$78,320	80.00%
2	Access Road Improvements	680/ft	12.06	680/ft	8,200	100.00%
3	Clearing and grubbing	1	12,000	1	12,000	100.00%
4	Repository Excavation	15200cu. yds.	2.07	15200cu. yds.	31,464	100.00%
5	Organic amendment	610T	135.75	488	66,246	80.00%
6	Prepare Repository subgrade	7450 sq.yds.	.40	7450 sq.yds.	2,980	100.00%
7a	GCL Bottom Liner	7450 sq.yds.	4.92	7450 sq.yds.	36,654	100.00%
7b	GCL "B" Grade layer	3120 sq.yds.	4.94	3120 sq.yds.	15,413	100.00%
8a	Leachate Collection pipe	170 ft	9.00	170 ft	1,530	100.00%
8b	Leachate Transmission pipe	98 ft	14.00	98 ft	1,372	100.00%
8c	Geocomposite	7450 sq.yds.	4.74	7450 sq.yds.	35,313	100.00%
8f	Sampling Barrel	1	250	1	250	100.00%
9	Building Demolition	1	1900	1	1,900	100.00%
10	Excavate TP1 and WR-5	18,300	5.73	14,640	83,887	80.00%
15a	Waste Rock grading WR1	1.1 acre	9258.56	1.1 acre	10,184	100.00%
15b	Waste Rock grading WR2	.65 acre	9258.56	.4875 acre	4,514	75.00%
15c	Waste Rock grading WR3	.88 acre	9258.56	.88 acre	8,147	100.00%
17a	Cover Soil Applic. WR1	2260 cu. yds.	4.21	2034 cu. yds.	8,563	90.00%
17b	Cover Soil Applic. WR2	2420 cu. yds.	4.21	484 cu. yds.	2,038	20.00%
17c	Cover Soil Applic. WR3	2420 cu. yds.	4.21	0	0	0.00%
22	Fences	6650 ft	3.95	2328	9,194	35.00%
24a	Discharge Permit	1	650	1	650	100.00%
24b	Straw Bales	200	6.00	0	0	0.00%
24c	Silt Fence	525ft	1.72	525ft	903	100.00%
TOTAL					419,722	



## SCHEDULE OF MATERIAL ON SITE

PROJECT TITLE: Brooklyn Mine Reclamation Project

DSL-AMRB: 94-007

CONTRACTOR: ENVIRONMENTAL RECLAMATION NORTHWEST, LLC

Item \_\_\_\_ Material Delivered \_\_\_\_\_  
Material in Place \_\_\_\_\_  
Material on Site \_\_\_\_\_

Item \_\_\_\_ Material Delivered \_\_\_\_\_  
Material in Place \_\_\_\_\_  
Material on Site \_\_\_\_\_

Item 11A, 7B Material Delivered 8-22, 25  
Material in Place \_\_\_\_\_  
Material on Site 36 Rolls GCL 15' x 125' (7,500 S.Y.) \$24,000.00

Item 21 Material Delivered \_\_\_\_\_  
Material in Place \_\_\_\_\_  
Material on Site 243 Rolls SC-150 Erosion Mat.  
7 Rolls C-125 Erosion Mat. \$14,576.60

Item \_\_\_\_ Material Delivered Misc. staples  
Material in Place \_\_\_\_\_  
Material on Site \_\_\_\_\_

Item \_\_\_\_ Material Delivered \_\_\_\_\_  
Material in Place \_\_\_\_\_  
Material on Site \_\_\_\_\_

Item \_\_\_\_ Material Delivered \_\_\_\_\_  
Material in Place \_\_\_\_\_  
Material on Site \_\_\_\_\_

TOTAL MATERIAL ON SITE

(Attach applicable invoices or bills of lading.)

\$38,576.60

Requested by: ENVIRONMENTAL RECLAMATION NORTHWEST, LLC

Contractor

To be Included in Payment Request No. 2

Note: Provide Invoice.



PAYMENT REQUEST NO. 3

FROM 9/1 TO 9/15

PROJECT TITLE: Brooklyn Mine Reclamation Project

LOCATION: \_\_\_\_\_ MONT A/E or DSL/AMRB: Q4-007

NAME OF CONTRACTOR: Environmental Reclamation Northwest, LLC

ADDRESS: P.O. Box 3809, Butte, MT 59702

CHANGE ORDERS			CONTRACT STATUS			
No.	Description	Amount	Total Amount	Completed Amount	Uncompleted Amount	Percent Complete
1	Non-pariel	\$45,207.89	\$773,430	\$562,643	\$210,787	72.75%
TOTAL CHANGE ORDERS						
CONTRACT TO DATE INCLUDING CHANGE ORDERS \$773,430			COMPLETED TO DATE \$524,066.00			
*For use only when securities are on deposit in lieu of retainage.			PLUS MATERIALS ON SITE \$38,576.60			
TOTAL RETAINAGE \$			TOTAL COMPLETED TO DATE \$562,642.60			
SECURITIES ON DEPOSIT \$			LESS RETAINAGE \$56,264.26			
ADJUSTED RETAINAGE \$			TOTAL AMOUNT EARNED TO DATE \$506,378.34			
			LESS PREVIOUS PAYMENTS \$414,600.74			
			AMOUNT DUE THIS PAYMENT \$91,777.60			
			LESS 1% TAX \$917.78			
			TOTAL DUE CONTRACT \$90,859.82			

I certify that this claim is correct and just in all respects and that payment or credit has not been received.

Environmental REclamation Northwest, LLC

Contractor

BY: [Signature]

DATE: 9/28/95

Owner

BY: \_\_\_\_\_

DATE: \_\_\_\_\_

RECOMMENDED BY:

Pioneer Technical Services, Inc.

Engineer

By: [Signature]

Date: 9/29/95

ITEMIZATION OF QUANTITIES AND COSTS						
Item	Description	Estimated Plan Quantity	Unit Price Bid	Units of Work Completed To Date	Total Cost of Complete Work	Percent Complete
1	Mobilization	1	97,900	L.S	\$78,320	80.00%
2	Access Road Improvements	680/ft	12.06	680/ft	8,200	100.00%
3	Clearing and grubbing	1	12,000	1	12,000	100.00%
4	Repository Excavation	15200cu. yds.	2.07	15200cu. yds.	31,464	100.00%
5	Organic amendment	610T	135.75	488	82,808	100.00%
6	Prepare Repository subgrade	7450 sq.yds.	.40	7450 sq.yds.	2,980	100.00%
7a	GCL Bottom Liner	7450 sq.yds.	4.92	7450 sq.yds.	36,654	100.00%
7b	GCL "B" Grade layer	3120 sq.yds.	4.94	3120 sq.yds.	15,413	100.00%
8a	Leachate Collection pipe	170 ft	9.00	170 ft	1,530	100.00%
8b	Leachate Transmission pipe	98 ft	14.00	98 ft	1,372	100.00%
8c	Geocomposite	7450 sq.yds.	4.74	7450 sq.yds.	35,313	100.00%
8d	Evaporation Pond Excavation	163 cu. yds.	2.82	163 cu. yds.	460	100.00%
8f	Sampling Barrel	1	250	1	250	100.00%
9	Building Demolition	1	1900	1	1,900	100.00%
10	Excavate TP1 and WR-5	18,300	5.73	18,300	104,859	100.00%
12	Const. Adit Discharge Drain	1	1,650	1	1,650	100.00%
13	Backfill & Grade TP1 & WR5	9770 cu. yds.	2.02	7816	15,788	80.00%
14a	Reconst. Stream Channel Adj. WR5	525 ft.	22.23	525 ft.	11,671	100.00%
14b	Add'l Stream Channel boulder Install.	20*	234	20*	4,680	100.00%
15a	Waste Rock grading WR1	1.1 acre	9258.56	1.1 acre	10,184	100.00%
15b	Waste Rock grading WR2	.65 acre	9258.56	.65 acre	6,019	100.00%
15c	Waste Rock grading WR3	.88 acre	9258.56	.88 acre	8,147	100.00%
16	Lime Application	82 T*	187.57	82 T*	15,381	100.00%
17a	Cover Soil Applic. WR1	2260 cu. yds.	4.21	2034 cu. yds.	8,563	90.00%
17b	Cover Soil Applic. WR2	2420 cu. yds.	4.21	484 cu. yds.	2,038	20.00%
17c	Cover Soil Applic. WR3	2420 cu. yds.	4.21	0	0	0.00%
22	Fences	6650 ft	3.95	5985 ft	23,641	90.00%
24a	Discharge Permit	1	650	1	650	100.00%
24b	Straw Bales	200	6.00/11.16**	110	1,228	55.00%
24c	Silt Fence	525ft	1.72	525ft	903	100.00%
TOTAL					524,066	

\* Quantity Change

\*\* With Silt Fence

0723 155  
120

100

ADDRESS: P.O. Box 3809, Butte, MT 59702

Amount of Original Contract		\$ 728,223
Change Order No. 1	\$ 45,208	
Change Order No. 2	\$ (5,536)	
Change Order No. _____	\$ _____	
Amount of Approved Change Order(s)		\$ 39,672
<b>TOTAL CONTRACT AMOUNT</b>		<b>\$ 767,895</b>

Pay Request No.	Amount of Request
1	\$ 213,205
2	\$ 201,396
3	\$ 91,777
4	\$ 261,517

Total Contract Amount Completed to Date	\$ 767,895
Less Retainage ( <u>10</u> %)	\$ 0
TOTAL AMOUNT EARNED TO DATE	\$ 767,895
Less Previous Payments	\$ 506,378
AMOUNT DUE THIS PAYMENT	\$ 261,517
Less 1% Tax	\$ 2,615
TOTAL DUE CONTRACTOR	\$ 258,902

APPROVED BY:

DEQ/ Abandoned Mine Reclamation Bureau

By Jack L. Bates DEQ-AMCB  
Date 10/25/95

30107 22-236-101 F

2 ~

Vinyl Record

1 - 21/9)



Item	Description	Contract Quantity	Contract Unit Price	Previous Quantity Requested	Current Quantity Completed	Total Quantity Completed To Date	Total Contract Amount Completed To Date	Amount Due This Payment
1	Mobilization	1	97,900.00	0.8	0.2	1	97,900	19,580
2	Access Road Improvements	680	12.06	680	0	680	8,201	0
3	Clearing and grubbing	1	12,000.00	1	0	1	12,000	0
4	Repository Excavation	15,200	2.07	15,200	0	15,200	31,464	0
5	Organic amendment	610	135.75	610	0	610	82,808	0
6	Prepare Repository subgrade	7,450	0.40	7,450	0	7,450	2,980	0
7a	GCL Bottom Liner	7,450	4.92	7,450	0	7,450	36,654	0
7b	GCL "B" Grade layer	3,120	4.94	3,120	0	3,120	15,413	0
8a	Leachate Collection pipe	170	9.00	170	0	170	1,530	0
8b	Leachate Transmission pipe	98	14.00	98	0	98	1,372	0
8c	Geocomposite	7,450	4.74	7,450	0	7,450	35,313	0
8d	Evaporation Pond Excavation	163	2.82	163	0	163	460	0
8e	Evaporation Pond Liner (GCL)	86	8.24	0	86	86	709	709
8f	Sampling Barrel	1	250.00	1	0	1	250	0
8g	Riprap Outfall	1	500.00	0	0	0	0	0
8h	Apply & Grade Evap. Cover Soil	56	4.82	0	56	56	270	270
9	Building Demolition	1	1,900.00	1	0	1	1,900	0
10	Excavate TP1 and WR-5	18,300	5.73	18,300	0	18,300	104,859	0
11a	GCL	7,450	4.34	0	6,875	6,875	29,838	29,838
11b	Geocomposite	7,450	4.30	0	6,875	6,875	29,563	29,563
11c	Apply & Grade Cover Soil	4,840	2.79	0	4,840	4,840	13,504	13,504
12	Const. Adit Discharge Drain	1	1,650.00	1	0	1	1,650	0
13	Backfill & Grade TP1 & WR5	9,770	2.02	7,816	1,954	9,770	19,735	3,947
14a	Reconst. Stream Channel Adj. WR5	525	22.23	525	0	525	11,671	0
14b	Add'l Stream Channel boulder Install.	25	234.00	20	0	20	4,680	0
15	Waste Rock grading WR1, WR2, WR3	2.63	9,258.56	2.63	0	2.63	24,350	0
16	Lime Application	46.9	187.57	82	0	82	15,381	0
17	Cover Soil Applic. WR1, WR2, WR3	7,100	4.21	2,518	4,582	7,100	29,891	19,290
18a	Repository Run-on Diversion	295	4.17	0	280	280	1,168	1,168
18b	Repository Runoff Diversion	90	5.20	0	155	155	806	806
18c	Waste Rock Dump Runon Diversioin	230	4.17	0	280	280	1,168	1,168
19a	Fertilize and Drill Seed	6.2	2,046.41	0	6.2	6.2	12,688	12,688
19b	Fertilize and Hydroseed	5.1	3,882.16	0	5.1	5.1	19,799	19,799
20a	Straw Mulch	6.2	891.13	0	6.2	6.2	5,525	5,525
20b	Hydromulch	5.1	1,470.39	0	5.1	5.1	7,499	7,499
21	Install Erosion Control Mat	14,050	2.35	0	12,000	12,000	28,200	28,200
22	Construct Fences	6,650	3.95	5,985	695	6,680	26,386	2,745
23	Obliterate & Reclaim Roadways	3,200	1.13	0	1,616	1,616	1,826	1,826
24a	Discharge Permit	1	650.00	1	0	1	650	0
24b	Straw Bales	200	6.00	110	0	110	660	0
24c	Silt Fence	525	1.72	855	0	855	1,471	0
C.O. #1	Excavate Nonpareil Dry Tailings	4,490	9.00	0	4,490	4,490	40,410	40,410
	Backfill & Grade Nonpareil Area	630	2.02	0	876	876	1,770	1,770
	Fertilize and Drill Seed	1.2	2,046.41	0	1.2	1.2	2,456	2,456
	Straw Mulch Nonpareil area	1.2	891.13	0	1.2	1.2	1,068	1,068
TOTAL							\$767,896	\$243,829

- 38,576.60

FOR MATERIALS  
ON-SITE



**APPENDIX F**

**PROJECT COMPLETION FORMS**



# AFFIDAVIT ON BEHALF OF CONTRACTOR

STATE OF MONTANA

DEQ-AMRB: 94-007

:ss

COUNTY OF GRANITE

DATE: OCTOBER 12, 1995

I certify to the best of my knowledge and belief that all work has been performed and materials supplied in strict conformance with the terms and conditions of the corresponding contract documents between the Montana Department of Environmental Quality, Abandoned Mine Reclamation Bureau, the Owner, and Environmental Reclamation Northwest, LLC, the Contractor, dated August 1, 1995 for the Brooklyn Mine Reclamation Project, DEQ-AMRB 94-007, and further declare that all bills for materials, supplies, utilities, and for all other things furnished or caused to be furnished by the above-named Contractor and used in the execution of the above Contract have been fully paid, and there are no unpaid claims or demands of State Agencies, subcontractors, materialmen, mechanics, laborers or any others resulting from or arising out of work done or ordered to be done by said Contractor under the above-identified Contract.

In consideration of the prior and final payments made and all payments made for authorized changes, the Contractor releases and forever discharges the Owner from any and all obligations and liabilities arising by virtue of said Contract and authorized changes between the parties hereto, either verbal or in writing, and any and all claims and demands of every kind and character whatsoever against the Owner, arising out of or in any way relating to said Contract, and authorized changes.

This statement is made for the purpose of inducing the Owner to make Final Payment under the terms of the Contract, relying on the truth and statements contained therein.

Dated this 12<sup>th</sup> day of October, 1995, at Butte, Montana.

CONTRACTOR: Environmental Reclamation Northwest, LLC

By: Jim Hamlich  
Title: Member

Subscribed and sworn to before me this 12 day of October, 1995.

(SEAL)

MaryAnn Sletten  
Notary Public for the State of Montana  
Residing at Butte  
My commission expires 2-16-96

## CONTRACTOR'S CERTIFICATE OF COMPLETION

TO (Owner): Montana Depart. of Environmental

DATE: October 11, 1995

Quality/Abandoned Mine Reclamation Bureau

PROJECT Title: Brooklyn Mine Reclamation Project

1625 Eleventh Avenue

Granite County, Montana

Helena, Montana 59620

DEQ-AMRB: 94-007

ATTN: Engineer William J. Bullock

CONTRACT DATE: August 1, 1995

FROM: Pioneer Technical Services, Inc., 105 N. Excelsior, Butte, Montana 59701  
(Firm or Corporation)

This is to certify that I, James J. Kambich, am an authorized official of Environmental Reclamation Northwest, LLC, working in the capacity of Member and have been properly authorized by said firm or corporation to sign the following statements pertaining to the subject contract:

I know of my own personal knowledge, and do hereby certify, that the work of the contract described above has been performed, and materials used and installed in every particular, in accordance with, and in conformity to, the Contract Plans and Specifications.

The contract work is now complete in all parts and requirements and ready for your substantial completion inspection.

I understand that neither the determination of the Engineer that the work is complete nor the acceptance thereof by the Owner shall operate as a bar to claim against the Contractor under the terms of the guarantee provisions of the Contract Documents.

CONTRACTOR: Environmental Reclamation Northwest, LLC

By: Jim Kambich, member  
Title

Distribution: 1. Project Manager  
2. Field Office  
3. File



**CONSENT OF  
SURETY COMPANY  
TO FINAL PAYMENT**

(From AIA Document G707)

OWNER  
ENGINEER  
CONTRACTOR  
SURETY  
OTHER

PROJECT: Brooklyn Mine Reclamation Project  
(name, address)

TO (Owner)

State of Montana  
Department of Environmental Quality  
P O Box 201601  
Helena MT 59620-1601

MONT AVE or  
DSL-AMRB NO.: 94-007

CONTRACT FOR: Brooklyn Mine Reclamation Project

CONTRACT DATE: 7/26/95

CONTRACTOR:

In accordance with the provisions of the contract between the Owner and the Contractors indicated above,  
the Amwest Surety Insurance Company, SURETY COMPANY, on bond  
of P O Box 4500 Woodland Hills CA 91365, CONTRACTOR, hereby approves of the final  
(here insert name and address of Contractor)  
payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety  
Company of any of its obligations to State of Montana Dept of Environmental Quality OWNER, as set  
(here insert name and address of Owner)  
forth in the said Surety Company's bond.

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand this 19th day of  
October, 1995.

Amwest Surety Insurance Company

Surety Company

Attest:  
(Seal)

*Beverly M. Kelly*

*Sylvia Tilzey*  
Signature of Authorized Representative

Sylvia Tilzey, Attorney-in-fact

Title

NOTE: This form is to be used as a companion document to the Affidavit on Behalf of Contractor (current edition).

# CERTIFICATE OF ACCEPTANCE

TO: Montana Department of Environmental Quality, Abandoned Mine Reclamation Bureau

OWNER

PROJECT TITLE: Brooklyn Mine Reclamation Project

DEQ-AMRB: 94-007

CONTRACT DATE: August 1, 1995

LOCATION: T7N, R12W, Section 5, Granite Co.

Deerlodge Nat. Forest, Philipsburg Ranger Dist.

PROJECT OR PART SHALL INCLUDE: All work  
items for the project as specified in the contract

DEQ-AMRB 94-007

CONTRACTOR: ERNW, LLC.

ADDRESS: P.O. Box 3805

Butte, Montana 59702

TELEPHONE NO: 406-782-0463

FINAL ACCEPTANCE DATE: October 13, 1995

DEQ INSPECTION DATE: October 13, 1995

ENGINEER: William J. Bullock, Pioneer Technical Services, Inc.  
105 N. Excelsior, Butte, Montana 59701

PERFORMANCE BOND NO: 1306971

DATE OF BOND: July 26, 1995

SURETY: AMWEST Surety Insurance Company

MONTANA AGENT: Heiness Labor Insurance, Inc.

ADDRESS: P.O. Box 30638

Billings, Montana 59107-0638

The Work performed under this Contract has been inspected by authorized representatives of the Owner, Contractor, and Engineer, and the Project (or specified part of the Project, as indicated above) is hereby declared to be totally completed and accepted on the above date.

ENGINEER: Pioneer Technical Services, Inc.

By

William J. Bullock  
Authorized Representative

10/13/95  
Date

The Contractor accepts the above Certificate of Acceptance and agrees to abide by the conditions of the one-year warranty period which began on the substantial completion date.

CONTRACTOR: ERNW, LLC.

By

Jim Kombeck (member)  
Authorized Representative

10/29/95  
Date

The Owner accepts the Project as totally complete, and final payment is due to the Contractor as provided in the contract documents.

OWNER: MDEQ/Abandoned Mine Reclamation Bureau

By

Jack D. [Signature]  
Authorized Representative

10/31/95  
Date

# CERTIFICATE OF SUBSTANTIAL COMPLETION

TO: Montana Department of Environmental Quality, Abandoned Mine Reclamation Bureau, OWNER

PROJECT TITLE: Brooklyn Mine Reclamation Project

DEQ-AMRB: 94-007

CONTRACT DATE: August 1, 1995

LOCATION: T7N, R12W, Section 5, Granite Co.

Deerlodge Nat. Forest, Philipsburg Ranger Dist.

PROJECT OR PART SHALL INCLUDE: All work items  
for the project as specified in the contract

DEQ-AMRB 94-007

CONTRACTOR: ERNW, LLC.

ADDRESS: P.O. Box 3805

Butte, Montana 59702

TELEPHONE NO: 406-782-0463

SUBSTANTIAL COMPLETION DATE: October 6, 1995

DEQ INSPECTION DATE: October 13, 1995

ENGINEER: William J. Bullock, Pioneer Technical Services, Inc.

105 N. Excelsior, Butte, Montana 59701

PERFORMANCE BOND NO: 1306971

DATE OF BOND: July 26, 1995

SURETY: AMWEST Surety Insurance Company

MONTANA AGENT: Heiness Labar Insurance, Inc.

ADDRESS: P.O. Box 30638

Billings, Montana 59107-0638

The Work performed under this Contract has been inspected by authorized representatives of the Owner, Contractor, and Engineer, and the Project (or specified part of the Project, as indicated above) is hereby declared to be substantially completed on the above date.

## DEFINITION OF SUBSTANTIAL COMPLETION

The date of substantial completion of a project or specified area of a project is the date when the construction is sufficiently completed, in accordance with the contract documents, as modified by any change orders agreed to by the parties, so the Owner can occupy or utilize the

A tentative list of items to be completed is appended hereto. This list may not be exhaustive, and the failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents.

ENGINEER: Pioneer Technical Services, Inc.

By William J. Bullock 10/31/95  
Authorized Representative Date

The Contractor accepts the above Certificate of Substantial Completion and agrees to complete and correct the items on the tentative list within the time indicated.

CONTRACTOR: ERNW, LLC.

By Jim Kamleit member 10/29/95  
Authorized Representative Date

The Owner accepts the Project or specified area of the Project as substantially complete and will assume full possession of the project or specified area at 4:00 (time), on OCTOBER 13 (date). The responsibility for heat, utilities, security, and insurance under the Contract Documents shall be as set forth under "Remarks" below.

OWNER: MDEQ/Abandoned Mine Reclamation Bureau

By Jack R. Yates 10/31/95  
Authorized Representative Date

Remarks: (Attach additional sheet, if necessary)





**APPENDIX G**  
**ENGINEERING COST ANALYSIS**



**ANALYSIS OF ENGINEERING COSTS INCURRED  
FOR THE MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY  
ABANDONED MINE RECLAMATION BUREAU  
DEQ/AMRB PROJECT NUMBER: DEQ/AMRB 94-007  
BROOKLYN MINE RECLAMATION PROJECT**

<b>ENGINEERING SERVICES</b>	<b>AMOUNT</b>
Work Plan, FSP, and Supporting Documents (Brooklyn and Non Pareil Sites)	\$52,131.28
Reclamation Investigation (Brooklyn and Non Pareil Sites)	
Loaded Labor	\$17,177.50
Equipment Rental and other expenses	\$3,022.50
Laboratory Analysis	\$22,552.55
Subtotal	\$42,752.55
Reclamation Investigation Report and Risk Assessment	\$14,464.04
EEE/CA Preparation	\$34,600.00
Design Engineering and Bid Specification Preparation	\$42,372.29
Construction Inspection and Mangement	
Direct Loaded Labor and other expenses	\$42,646.20
Laboratory Analysis	\$7,413.82
Subtotal	\$50,060.02
<b>Total Engineering Costs</b>	<b><u>\$236,380.18</u></b>

<b>CONSTRUCTION SERVICES</b>	<b>AMOUNT</b>
ERNW Contract	\$767,895.00
Stream Diversion Structure Construction	
Direct Loaded Labor	\$11,063.82
Equipment Rental and other expenses	\$2,066.92
Materials	\$12,310.63
Subtotal	\$25,441.37
<b>Total Construction Costs</b>	<b><u>\$793,336.37</u></b>

**PERCENTAGE ENGINEERING FEES TO CONSTRUCTION COST:**

Planning-Characterization/Construction Cost	18.1%
Design Engineering/Construction Cost	5.3%
Construction Engineering/Construction Cost	6.3%
<b>Total Engineering Cost/Construction Cost</b>	<b>29.7%</b>





## **APPENDIX H**

### **CONSTRUCTION BID PACKAGE DRAWINGS**

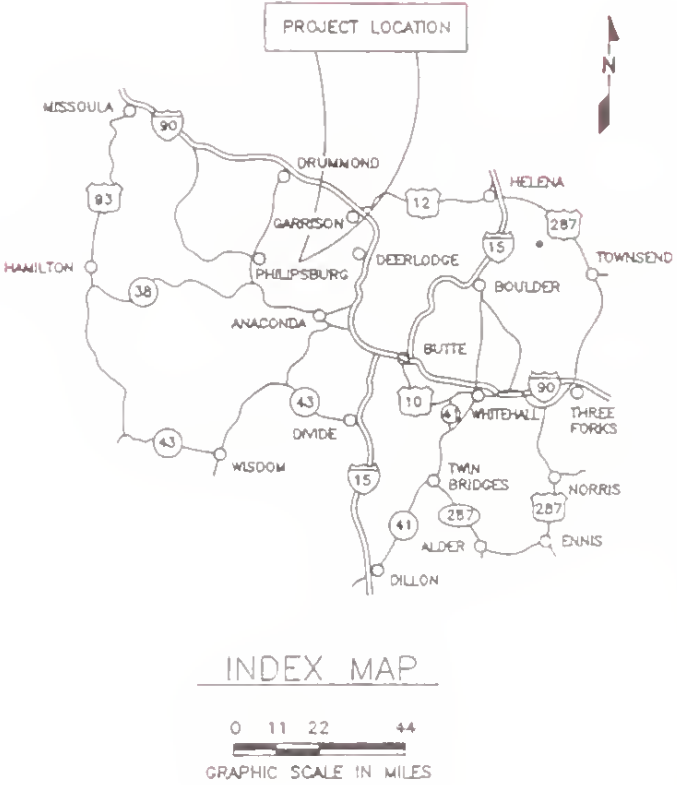
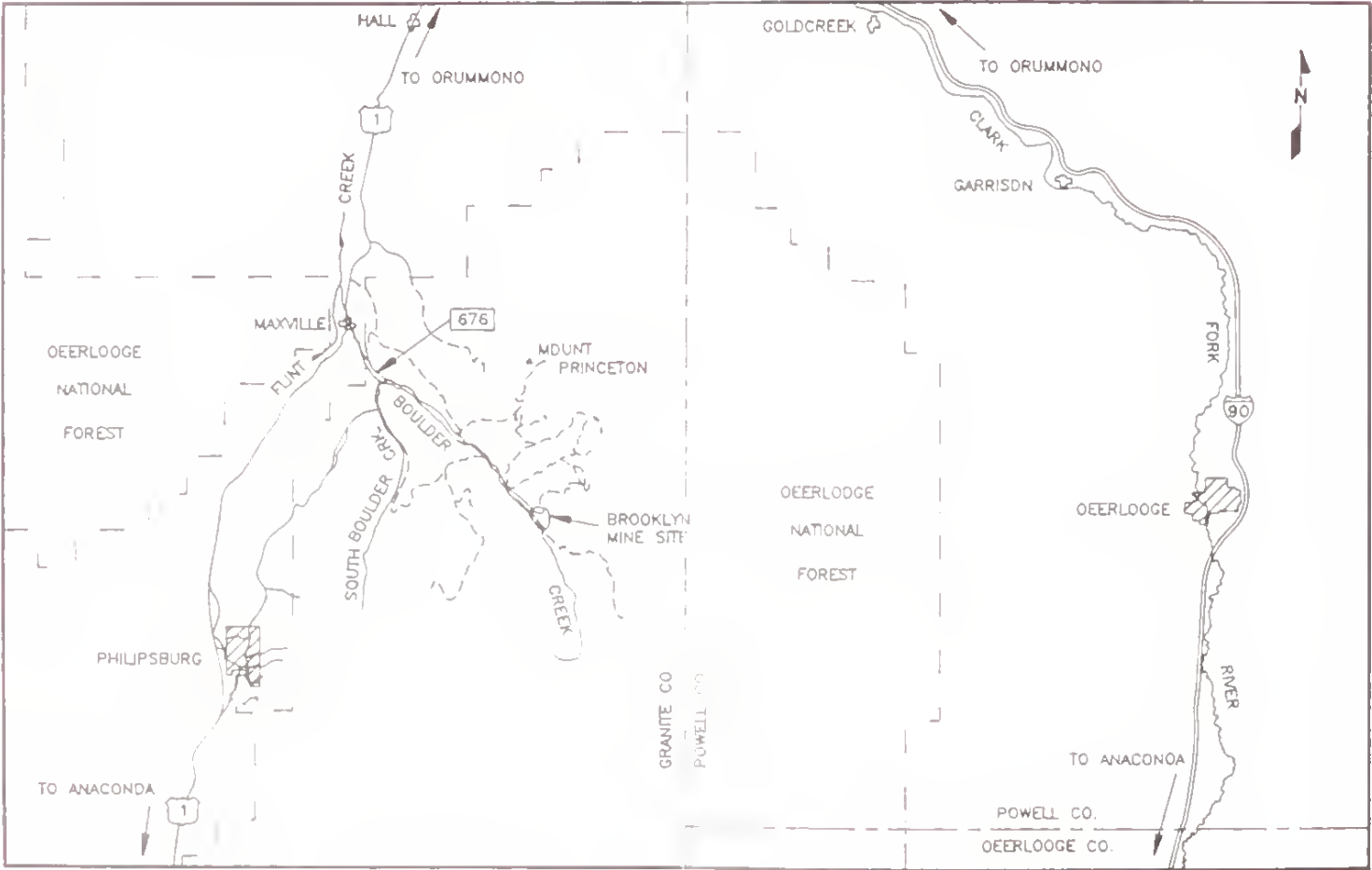


SHEET INDEX	
SHEET NO.	DESCRIPTION
1	COVER
2	LEGEND
3	SITE MAP
4	ROAD IMPROVEMENT PLAN
5	REPOSITDRY BASE GRADES
6	REPOSITORY FINAL GRADES
7	WR5 AND TAILINGS POND REMOVAL PLAN
8	WR1 REGRADING PLAN
9	WR2 AND WR3 REGRADING PLAN
10	PRESENT STREAM CONDITIONS (1 OF 2) AND DIVERSION STRUCTURE
11	PRESENT STREAM CONOTIONS (2 OF 2)
12	STREAM RESTORATION PLAN (1 OF 2)
13	STREAM RESTORATION PLAN (2 OF 2)
14	FENCING PLAN
15	REPOSITORY DETAILS
16	LEACHATE EVAPORATION POND OETAILS
17	LEACHATE COLLECTION DETAILS
18	FRENCH DRAIN & LEACHATE COLLECTION OETAILS
19	ORAINAGE OETAILS
20	STREAM RESTORATION AND ROAD OETAILS
21	REPOSITDRY CROSS SECTIONS
22	WR5 REMOVAL CROSS SECTIONS (1 OF 2)
23	WR5 REMOVAL CROSS SECTIONS (2 OF 2)
24	FENCING OETAILS (1 OF 2)
25	FENCING DETAILS (2 OF 2)
26	EROSION CONTROL MAT DETAILS
27	ROAD DBLITERATION PLAN
28	TEMPORARY EROSION CONTROL

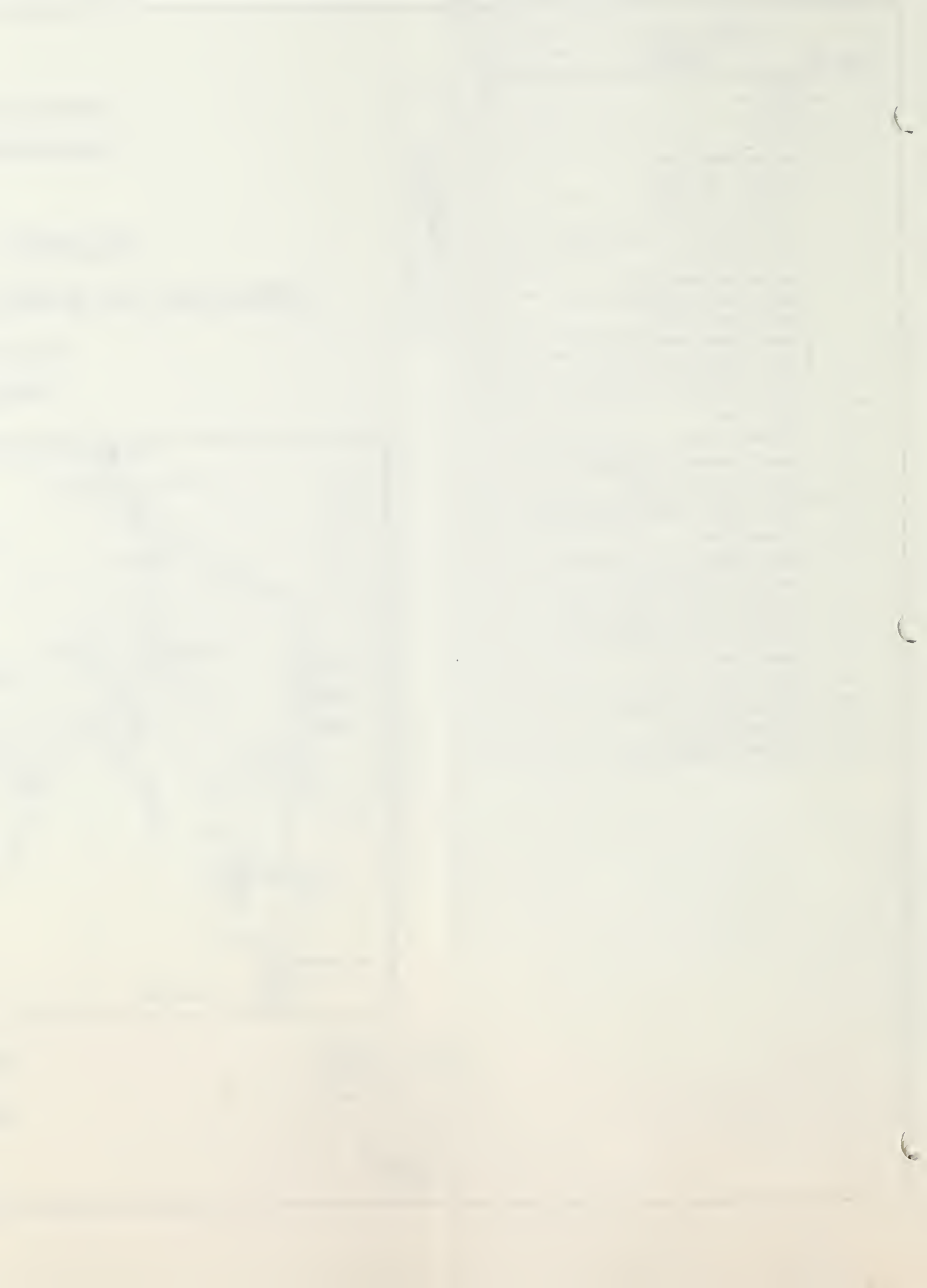
MONTANA DEPARTMENT OF STATE LANDS  
ABANDONED MINE RECLAMATION BUREAU

PLANS FOR PROPOSED  
BROOKLYN MINE RECLAMATION PROJECT

DEERLODGE NATIONAL FOREST  
GRANITE COUNTY, MONTANA



DESIGNED BY: PIONEER TECHNICAL SERVICES DRAWN BY: PRECISION DRAFTING SERVICES CHECKED BY: BOA	SHEET 1 OF 28
DRAWN FOR: <b>PIONEER</b> TECHNICAL SERVICES, INC. P.O. BOX 3446 BUTTE, MT 59702	TITLE: BROOKLYN RECLAMATION PLAN
DRAWING NO.: PT340910 DATE: 6/25/95	REV: - PLOT SCALE: 1" = 1'





## SYMBOLS



EXISTING ROAD  
IMPROVED



EXISTING ROAD  
UNIMPROVED



EXISTING ROAD/TRAIL  
PRIMITIVE



EXISTING ROAD  
TO BE IMPROVED



LEACHATE COLLECTION  
PIPE



LEACHATE TRANSMISSION  
PIPE



EXISTING SURFACE  
WATER DRAINAGE



DITCH /DIVERSION



MINE WASTE REMOVAL  
LIMITS (SHT. 13)



ADIT DISCHARGE FRENCH DRAIN



WASTE ROCK DUMP/  
TAILINGS POND BOUNDARY



WASTE ROCK DUMP/  
CONSOLIDATION BOUNDARY



NEW FENCE



EXISTING CONTOUR



EXISTING CONTOUR,  
5 FOOT INTERVAL



RPRAP

5

NOTE



SLOPE DIRECTION



SECTION CUTTING PLANE  
AND VIEWING DIRECTION



STRUCTURES



TIMBER



STRAW BALE DIKES



SILT FENCE

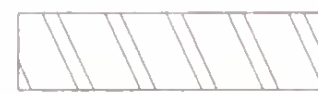
## PATTERNS



MINE WASTE



NATIVE SOIL/COVER SOIL



RECOMPACTED NATIVE  
SOIL



GEOCOMPOSITE



GEOSYNTHETIC  
CLAY LINER



B-GRADE GEOSYNTHETIC  
CLAY LINER



TYPE 1 BEDDING MATERIAL



TYPE 2 BEDDING MATERIAL



ROAD TO BE OBLITERATED/  
RECLAIMED



EROSION CONTROL BLANKET

## ACRONYMS

APPROX. = APPROXIMATELY

AVE = AVERAGE

CL = CENTER LINE

EX = EXISTING

GCL = GEOSYNTHETIC CLAY LINER

I.E. = INVERT ELEVATION

O.C. = ON CENTER

PVC = POLYVINYL CHLORIDE

REF = REFERENCE

SHT = SHEET

TP = TAILINGS POND

TYP = TYPICAL

WR = WASTE ROCK

DESIGNED BY: PIONEER TECHNICAL SERVICES  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BQA

DRAWN FOR:

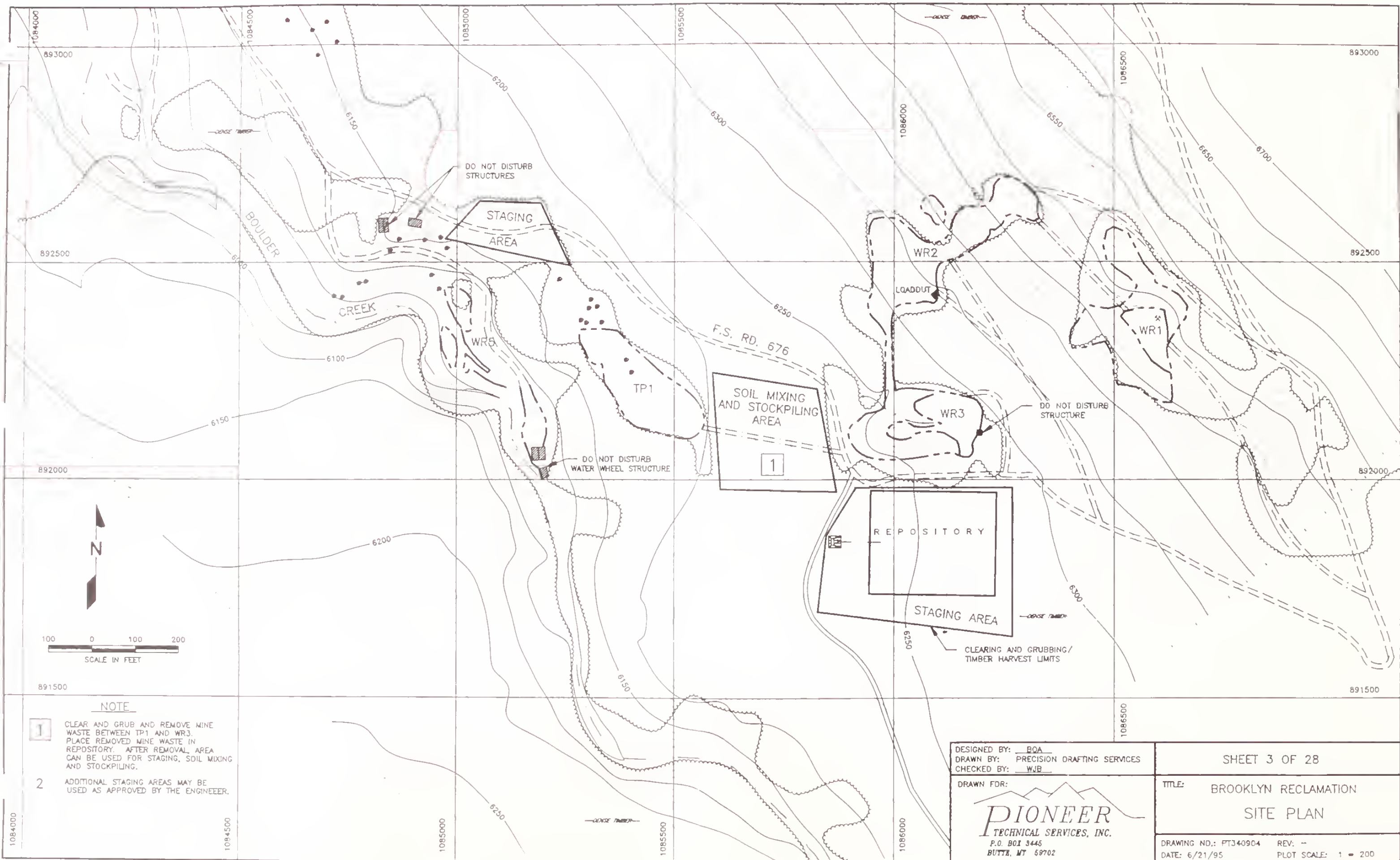
**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3446  
BUTTE, MT 59702

SHEET 2 OF 28

TITLE: BROOKLYN RECLAMATION  
LEGEND

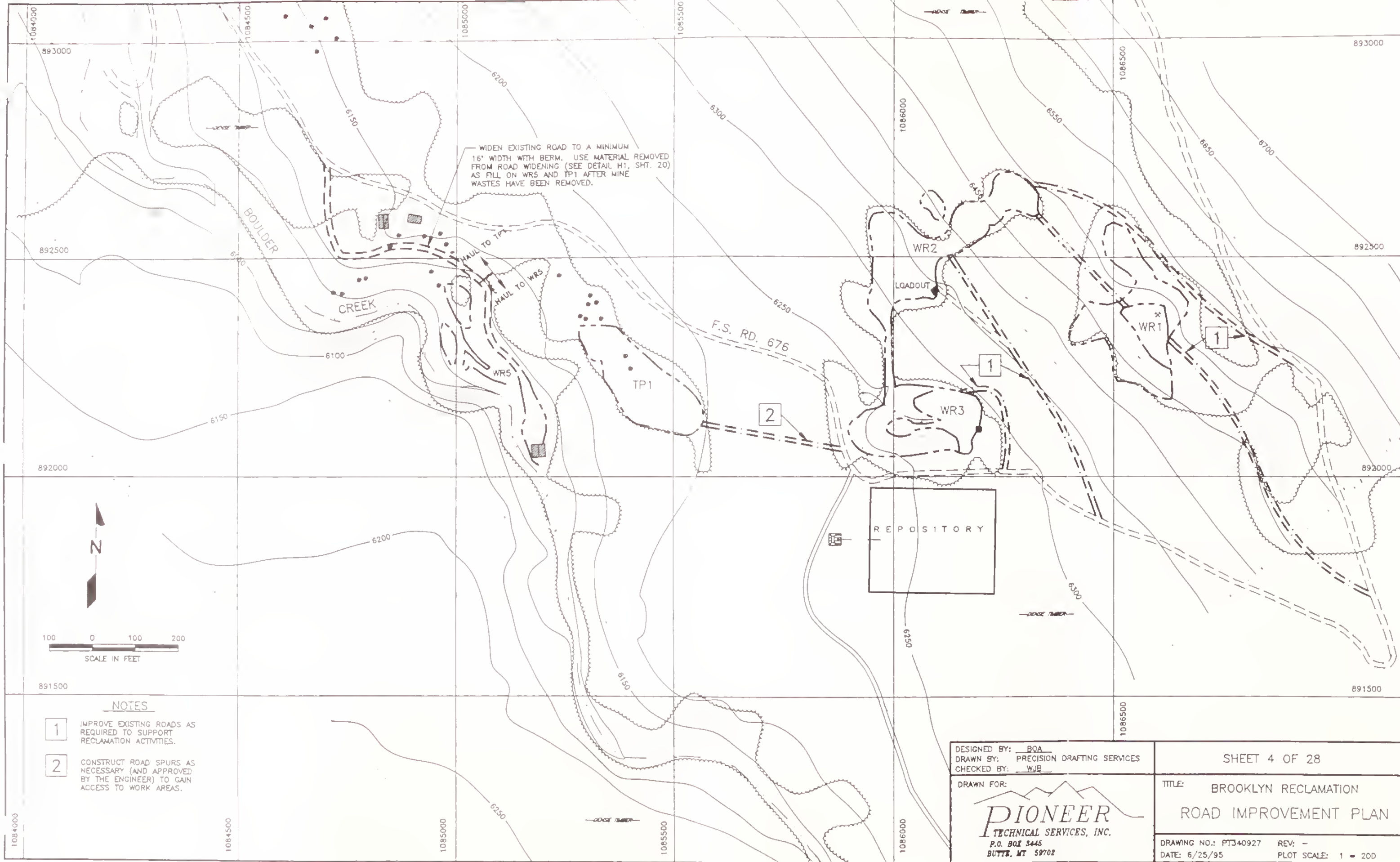
DRAWING NO.: PT340917 REV: -  
DATE: 6/22/95 PLOT SCALE: 1 = 1











NOTES

- 1 IMPROVE EXISTING ROADS AS REQUIRED TO SUPPORT RECLAMATION ACTIVITIES.
- 2 CONSTRUCT ROAD SPURS AS NECESSARY (AND APPROVED BY THE ENGINEER) TO GAIN ACCESS TO WORK AREAS.

DESIGNED BY: BOA  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: WJB

DRAWN FOR:

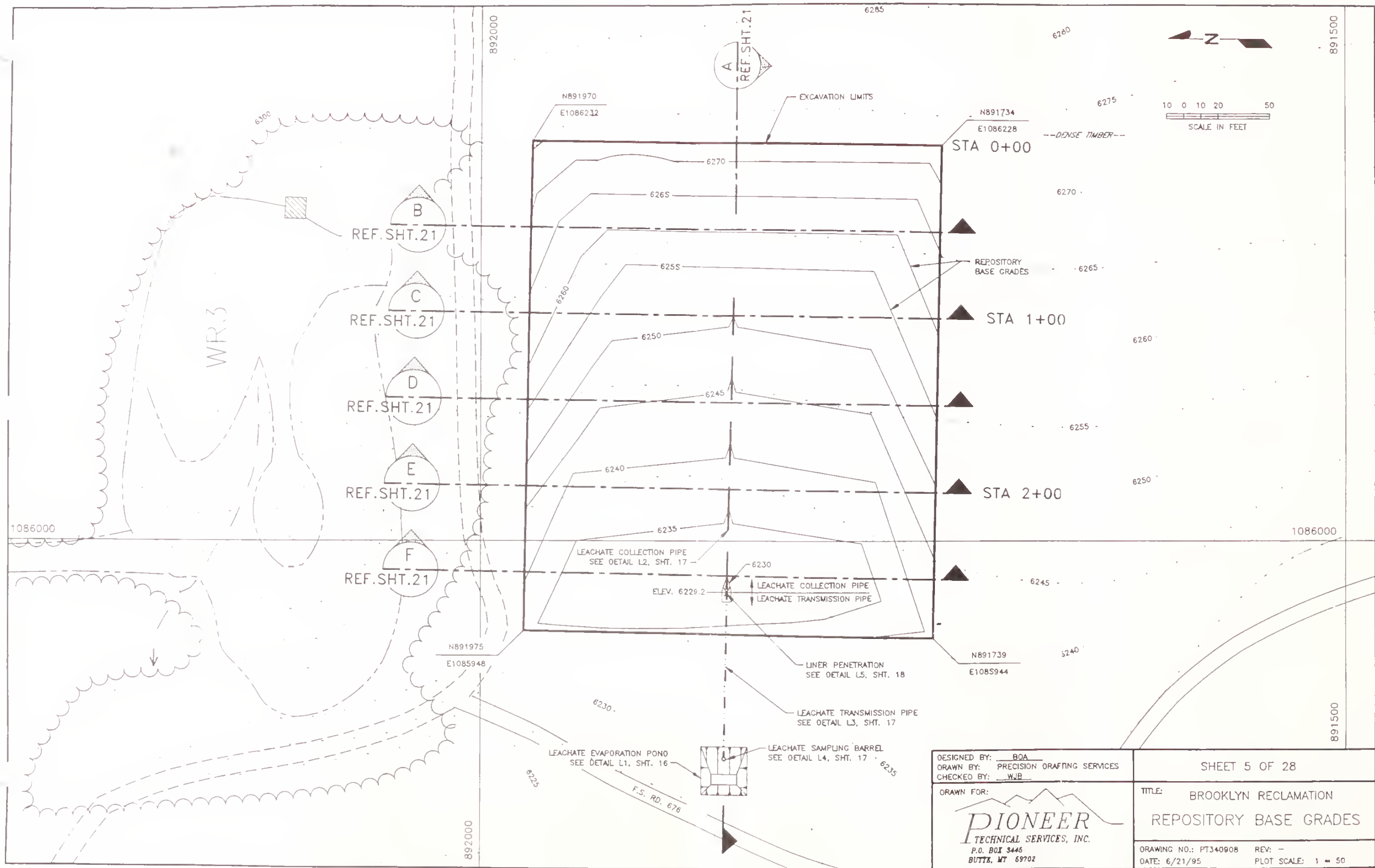
**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 4 OF 28

TITLE: BROOKLYN RECLAMATION  
ROAD IMPROVEMENT PLAN

DRAWING NO.: PT340927 REV: -  
DATE: 6/25/95 PLOT SCALE: 1" = 200'

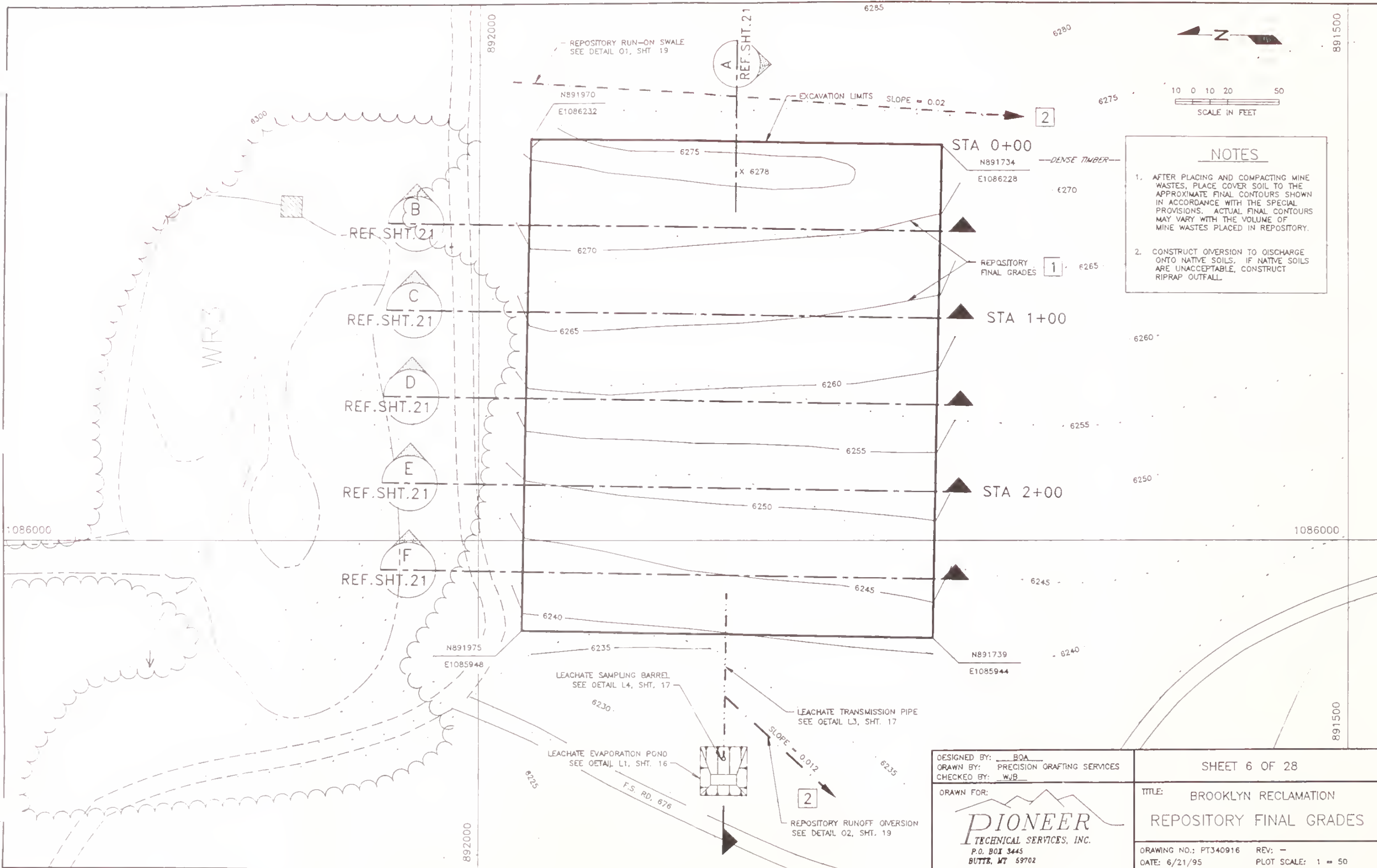




DESIGNED BY: BOA DRAWN BY: PRECISION DRAFTING SERVICES CHECKED BY: WJB	SHEET 5 OF 28
DRAWN FOR: <b>PIONEER</b> TECHNICAL SERVICES, INC. P.O. BOX 3446 BUTTE, MT 59702	TITLE: BROOKLYN RECLAMATION REPOSITORY BASE GRADES
DRAWING NO.: PT340908 DATE: 6/21/95	REV: - PLOT SCALE: 1" = 50'







REPOSITORY RUN-ON SWALE  
SEE DETAIL 01, SHT. 19

A  
REF. SHT. 21

N891970  
E1086232

EXCAVATION LIMITS  
SLOPE = 0.02

2

STA 0+00

N891734  
E1086228

DENSE TIMBER

REF. SHT. 21

B

REF. SHT. 21

C

REF. SHT. 21

D

REF. SHT. 21

E

REF. SHT. 21

F

REPOSITORY  
FINAL GRADES

1

STA 1+00

STA 2+00

### NOTES

1. AFTER PLACING AND COMPACTING MINE WASTES, PLACE COVER SOIL TO THE APPROXIMATE FINAL CONTOURS SHOWN IN ACCORDANCE WITH THE SPECIAL PROVISIONS. ACTUAL FINAL CONTOURS MAY VARY WITH THE VOLUME OF MINE WASTES PLACED IN REPOSITORY.
2. CONSTRUCT OVERLAP TO DISCHARGE ONTO NATIVE SOILS. IF NATIVE SOILS ARE UNACCEPTABLE, CONSTRUCT RIPRAP OUTFALL.

LEACHATE SAMPLING BARREL  
SEE DETAIL L4, SHT. 17

LEACHATE TRANSMISSION PIPE  
SEE DETAIL L3, SHT. 17

LEACHATE EVAPORATION POND  
SEE DETAIL L1, SHT. 16

REPOSITORY RUNOFF OVERLAP  
SEE DETAIL 02, SHT. 19

DESIGNED BY: BOA  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: WJB

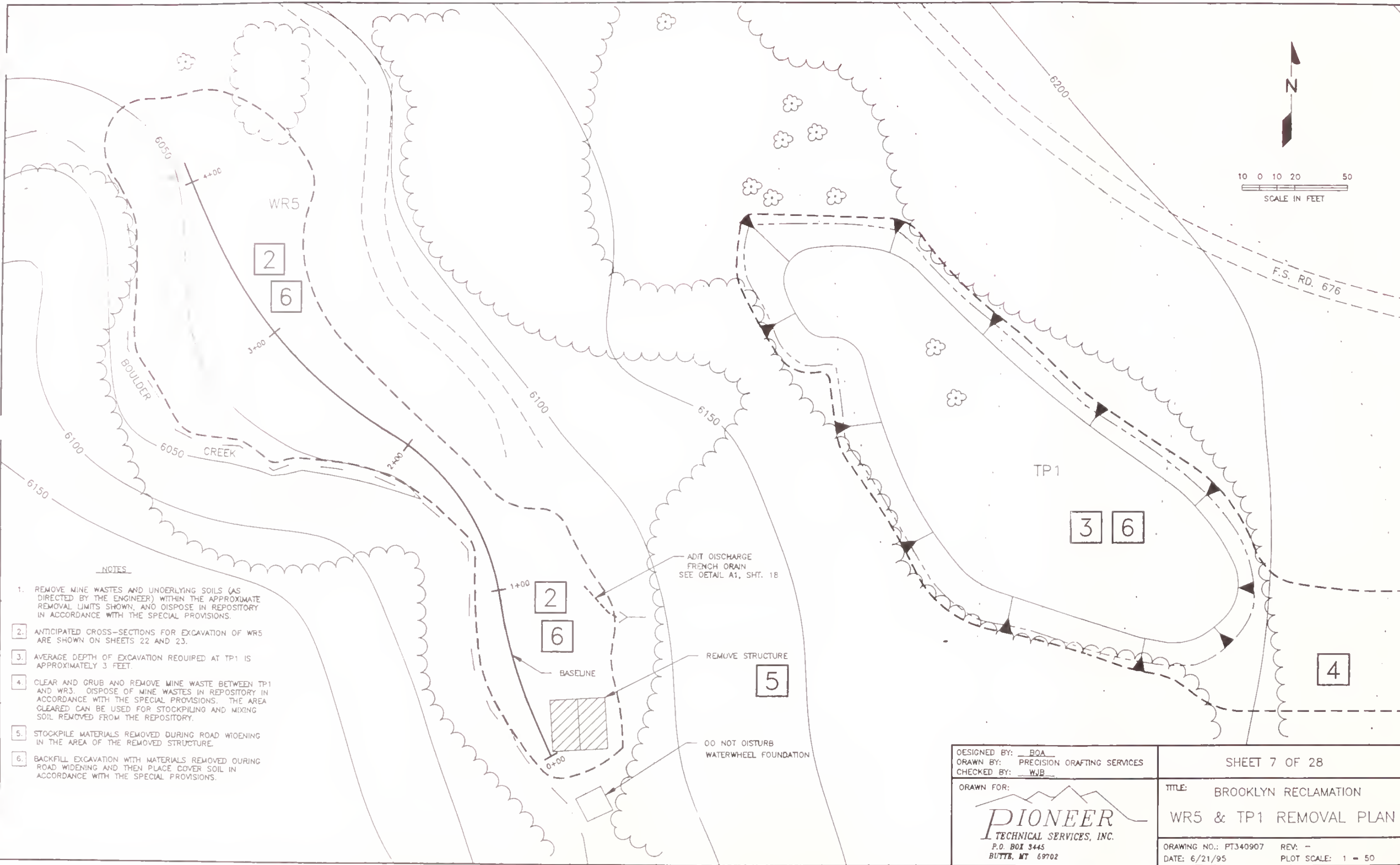
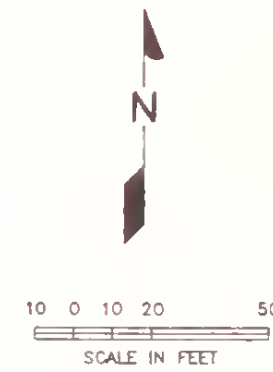
DRAWN FOR:  
**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 6 OF 28

TITLE: BROOKLYN RECLAMATION  
REPOSITORY FINAL GRADES

DRAWING NO.: PTJ40916 REV: -  
DATE: 6/21/95 PLOT SCALE: 1" = 50'





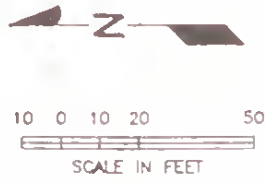
NOTES

1. REMOVE MINE WASTES AND UNDERLYING SOILS (AS DIRECTED BY THE ENGINEER) WITHIN THE APPROXIMATE REMOVAL LIMITS SHOWN, AND DISPOSE IN REPOSITORY IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
2. ANTICIPATED CROSS-SECTIONS FOR EXCAVATION OF WR5 ARE SHOWN ON SHEETS 22 AND 23.
3. AVERAGE DEPTH OF EXCAVATION REQUIRED AT TP1 IS APPROXIMATELY 3 FEET.
4. CLEAR AND GRUB AND REMOVE MINE WASTE BETWEEN TP1 AND WR3. DISPOSE OF MINE WASTES IN REPOSITORY IN ACCORDANCE WITH THE SPECIAL PROVISIONS. THE AREA CLEARED CAN BE USED FOR STOCKPILING AND MIXING SOIL REMOVED FROM THE REPOSITORY.
5. STOCKPILE MATERIALS REMOVED DURING ROAD WIDENING IN THE AREA OF THE REMOVED STRUCTURE.
6. BACKFILL EXCAVATION WITH MATERIALS REMOVED DURING ROAD WIDENING AND THEN PLACE COVER SOIL IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

DESIGNED BY: BOA DRAWN BY: PRECISION DRAFTING SERVICES CHECKED BY: WJR	SHEET 7 OF 28
ORAWN FOR:  PIONEER TECHNICAL SERVICES, INC. P.O. BOX 3445 BUTTE, MT 69702	TITLE: BROOKLYN RECLAMATION WR5 & TP1 REMOVAL PLAN
	DRAWING NO.: PT340907 REV: - DATE: 6/21/95 PLOT SCALE: 1 = 50







6650

6600

1086500

6550

6500

6450

6400

892000

1086500

892000

NOTES

WASTE ROCK DUMP #1 WILL BE GRADED TO A TARGET SLOPE OF 2.3 : 1, REQUIRING CUTTING AND FILLING OF APPROXIMATELY 5750 CUBIC YARDS OVER A 1.4 ACRE AREA. WASTE FROM THE DUMP FACE SHALL BE BROUGHT UP TO BACKFILL THE PIT ABOVE.

APPROX. GRADED WASTE ROCK CONSOLIDATION BOUNDARY

WR1

DESIGNED BY: WJB  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 8 OF 28

TITLE: BROOKLYN RECLAMATION  
WR1 GRADING PLAN

DRAWING NO.: PT340905 REV: -  
DATE: 6/21/95 PLOT SCALE: 1" = 50'



DESIGNED BY: WJB  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

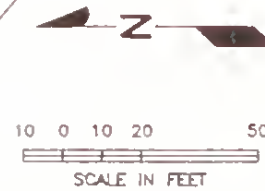
DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 9 OF 28

TITLE: BROOKLYN RECLAMATION  
WR2 & WR3 GRADING PLAN

DRAWING NO.: PT340906 REV: --  
DATE: 6/21/95 PLOT SCALE: 1" = 50'



RUNOFF DIVERSION  
SEE DETAIL 03, SHT. 19

WASTE ROCK REMOVAL AREA  
(APPROX. AVE. 2' THICK)

### NOTES

WASTE ROCK DUMP #2 WILL BE CONSOLIDATED AND GRADED TO A TARGET SLOPE OF 2.9 : 1, REQUIRING CUTTING AND FILLING OF APPROXIMATELY 4,000 CUBIC YARDS. WASTE ROCK SHALL BE CONSOLIDATED TO AN AREA OF APPROXIMATELY 1.1 ACRES. THE TOTAL AREA REQUIRING RECLAMATION IS APPROXIMATELY 1.5 ACRES.

### NOTES

WASTE ROCK DUMP #3 SHALL BE GRADED TO A TARGET SLOPE OF 4.5 : 1, REQUIRING CUTTING AND FILLING OF APPROXIMATELY 7,200 CUBIC YARDS OVER A 1.5 ACRE AREA.

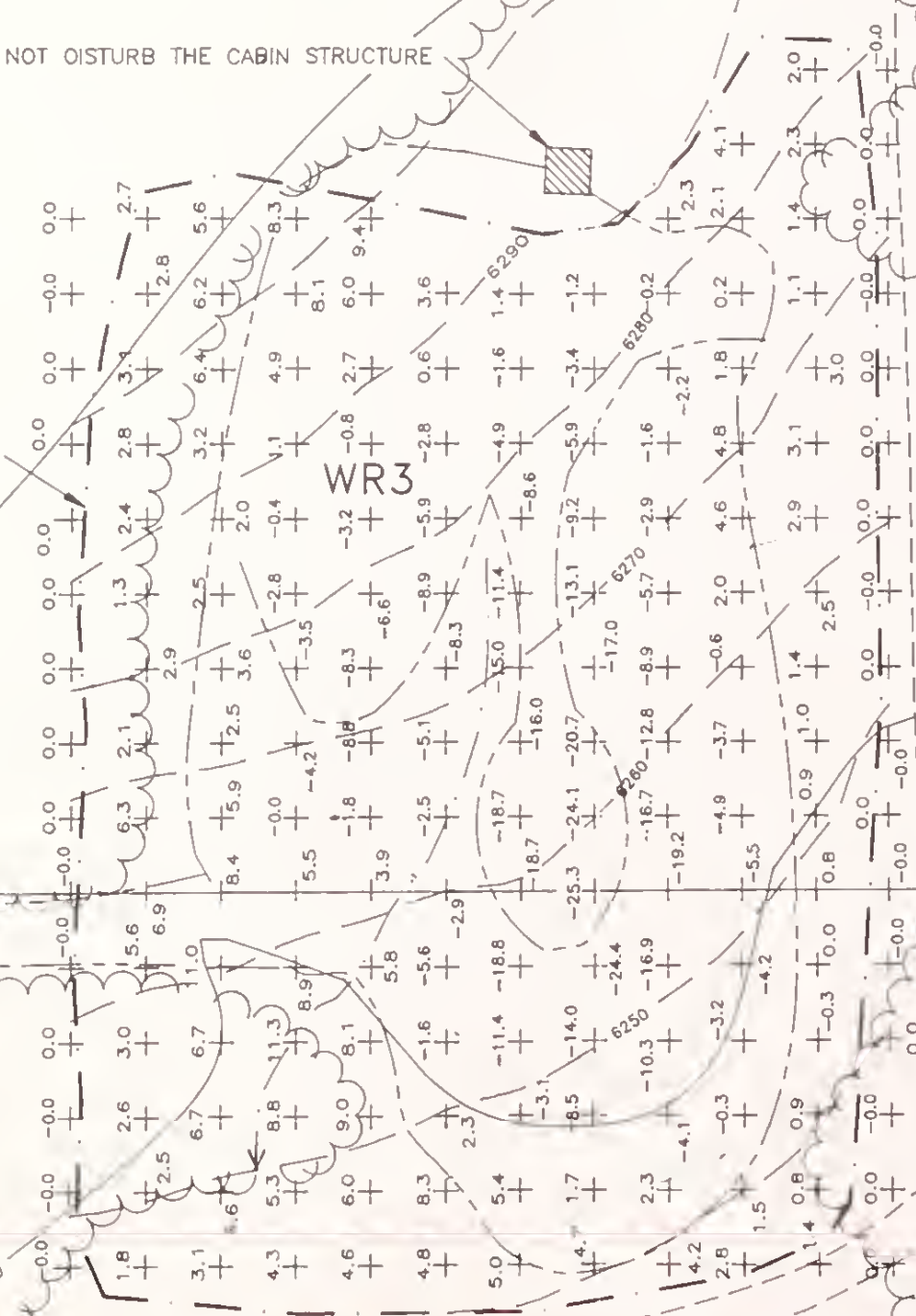
DO NOT DISTURB THE CABIN STRUCTURE

APPROXIMATE CONSOLIDATION BOUNDARIES

LOADOUT

WR2

WR3

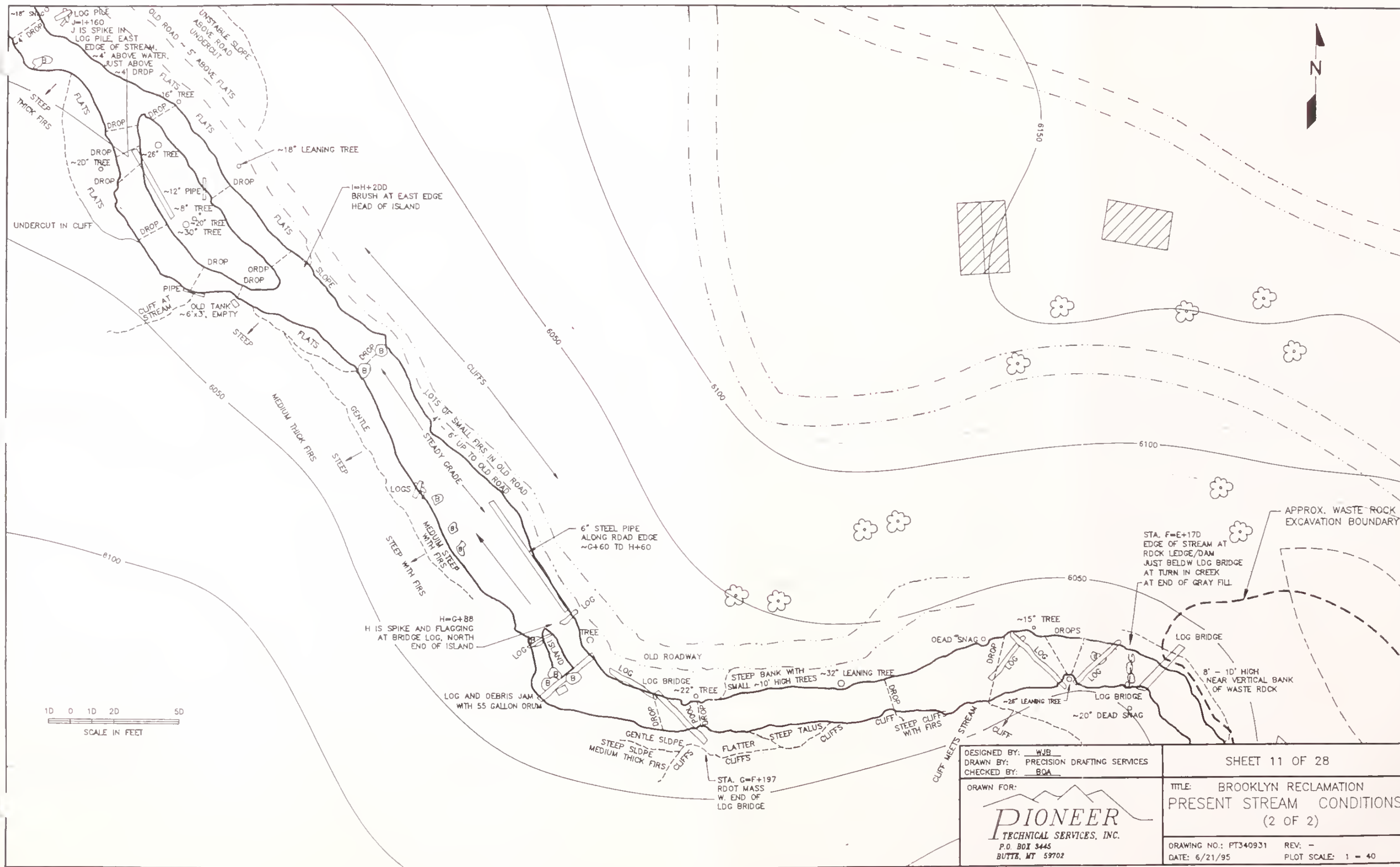









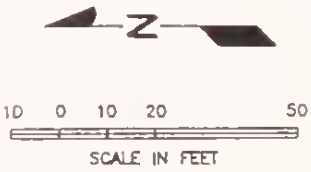
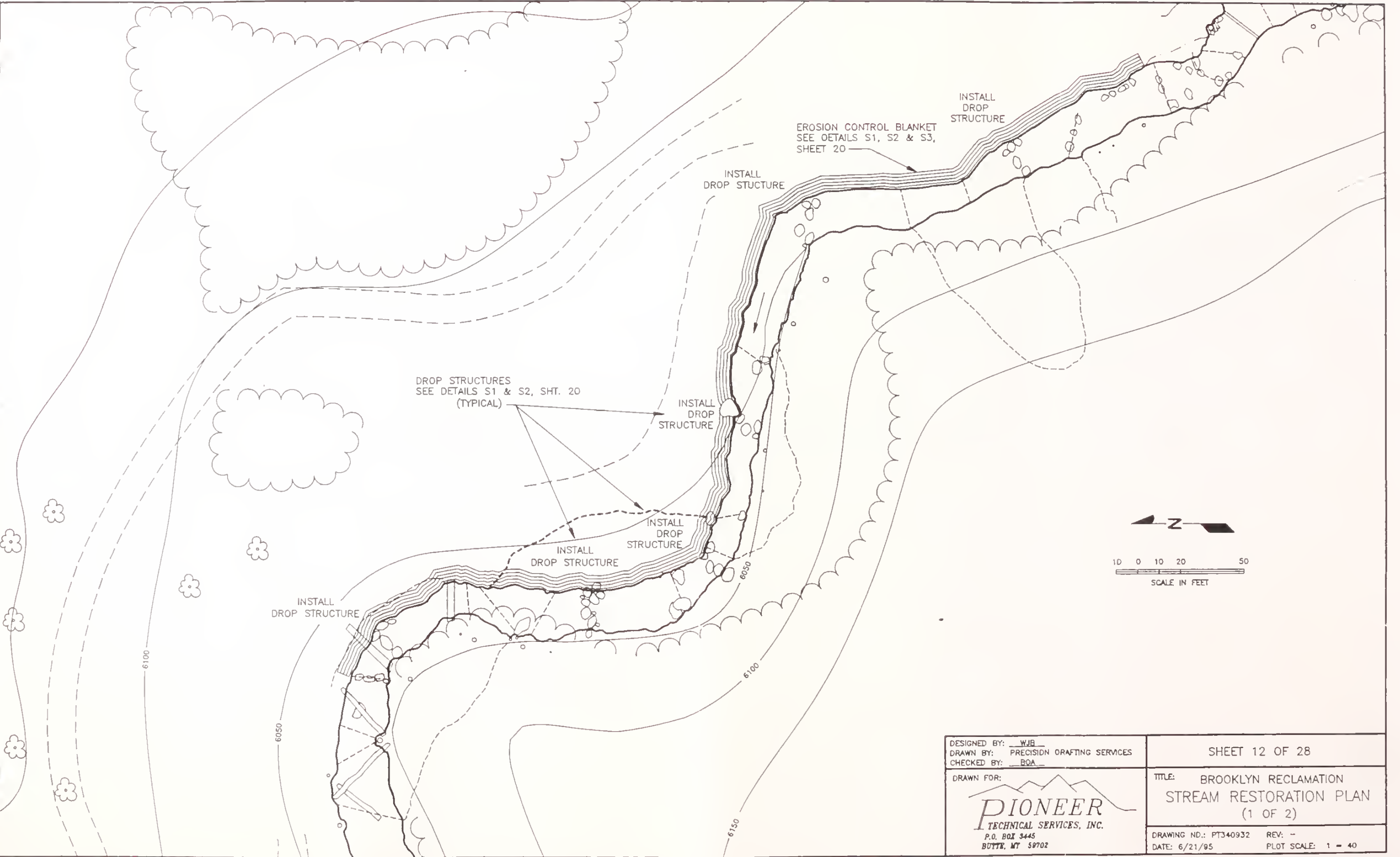





DESIGNED BY: <u>WJB</u> DRAWN BY: <u>PRECISION DRAFTING SERVICES</u> CHECKED BY: <u>BOA</u>	SHEET 11 OF 28
DRAWN FOR:  <b>PIONEER</b> TECHNICAL SERVICES, INC. P.O. BOX 3445 BUTTE, MT 59702	TITLE: <b>BROOKLYN RECLAMATION PRESENT STREAM CONDITIONS (2 OF 2)</b>  DRAWING NO.: PT340931 REV: - DATE: 6/21/95 PLOT SCALE: 1" = 40'







DESIGNED BY: <u>WJB</u> DRAWN BY: <u>PRECISION DRAFTING SERVICES</u> CHECKED BY: <u>BOA</u>	SHEET 12 OF 28
DRAWN FOR:  <b>PIONEER</b> TECHNICAL SERVICES, INC. P.O. BOX 3445 BUTTE, MT 59702	TITLE: <b>BROOKLYN RECLAMATION STREAM RESTORATION PLAN (1 OF 2)</b>
DRAWING NO.: PT340932 DATE: 6/21/95	REV: - PLOT SCALE: 1" = 40'





10 0 10 20 50  
SCALE IN FEET

DESIGNED BY: WJB  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

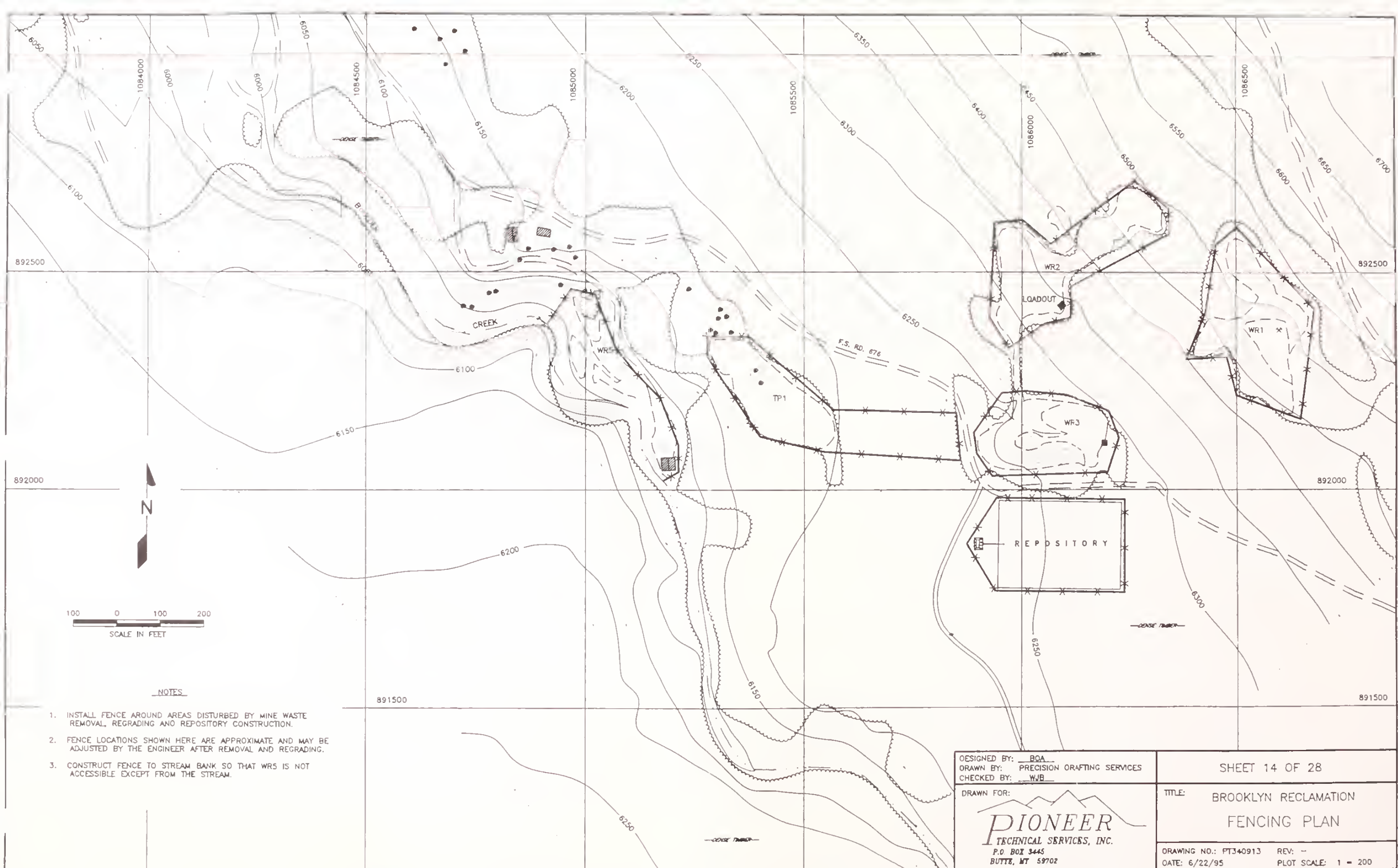
SHEET 13 OF 28

TITLE: BROOKLYN RECLAMATION  
STREAM RESTORATION PLAN  
(2 OF 2)

DRAWING NO.: PT340933 REV: -  
DATE: 6/22/95 PLOT SCALE: 1" = 40'







NOTES

1. INSTALL FENCE AROUND AREAS DISTURBED BY MINE WASTE REMOVAL, REGRADING AND REPOSITORY CONSTRUCTION.
2. FENCE LOCATIONS SHOWN HERE ARE APPROXIMATE AND MAY BE ADJUSTED BY THE ENGINEER AFTER REMOVAL AND REGRADING.
3. CONSTRUCT FENCE TO STREAM BANK SO THAT WRS IS NOT ACCESSIBLE EXCEPT FROM THE STREAM.

DESIGNED BY: BQA  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: WJB

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

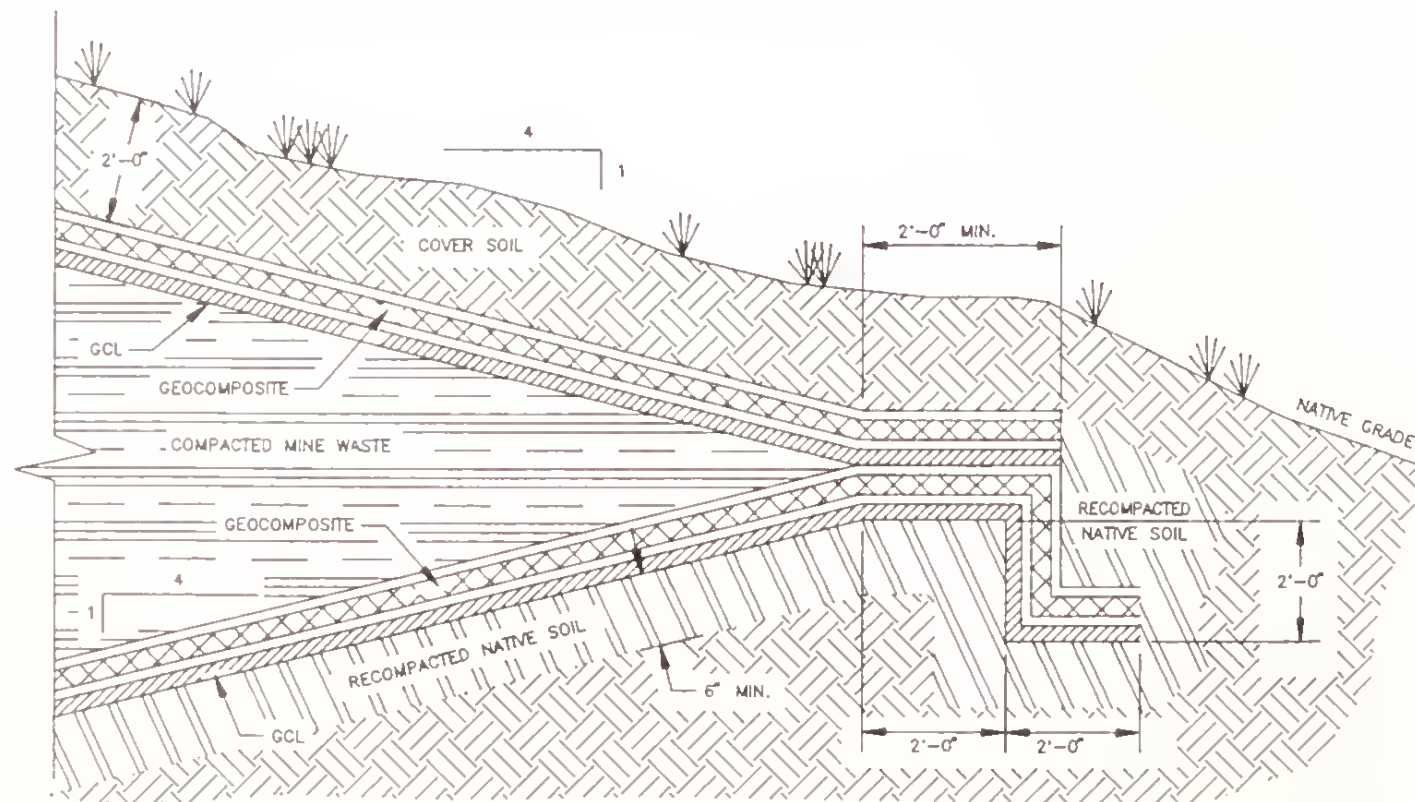
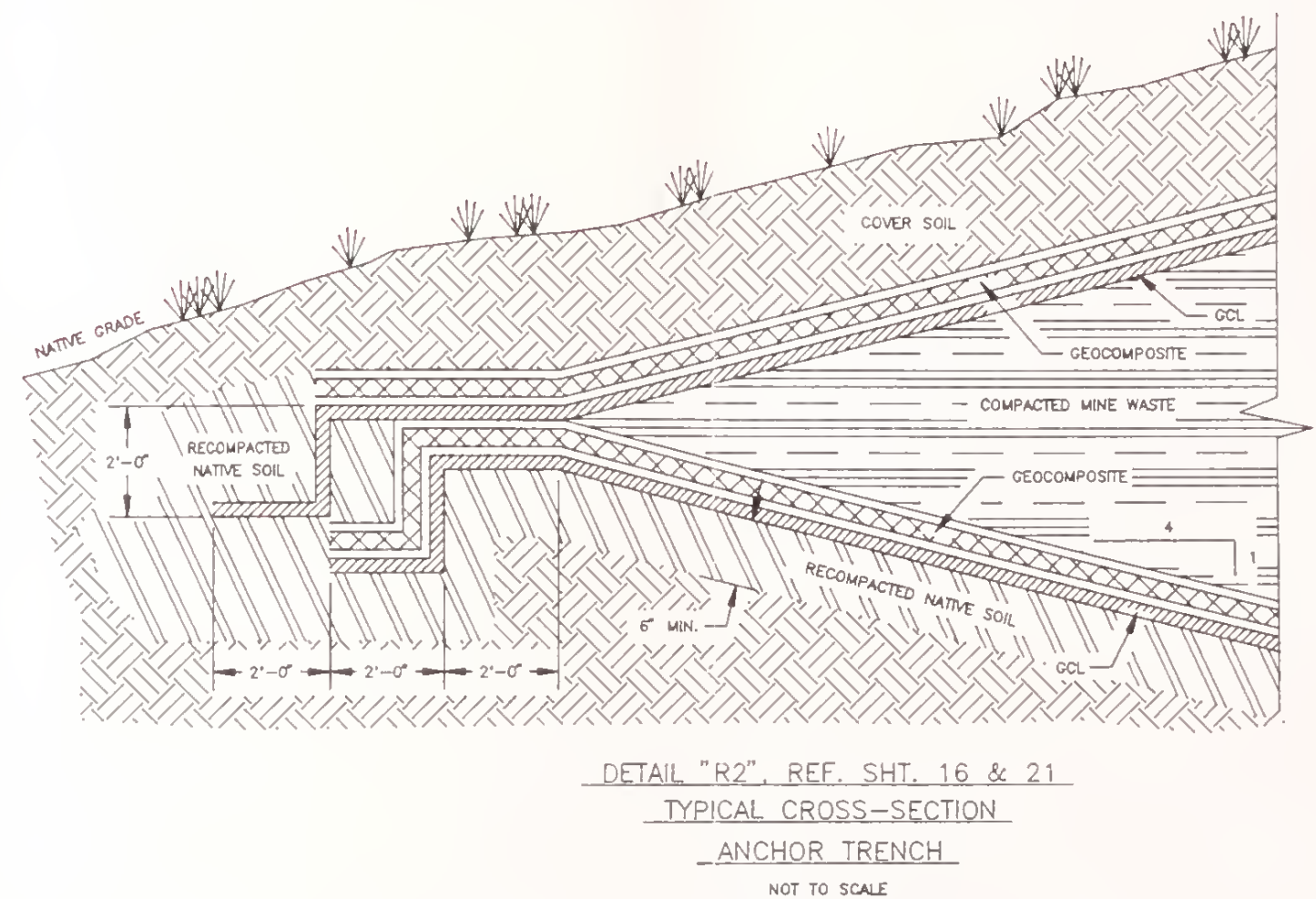
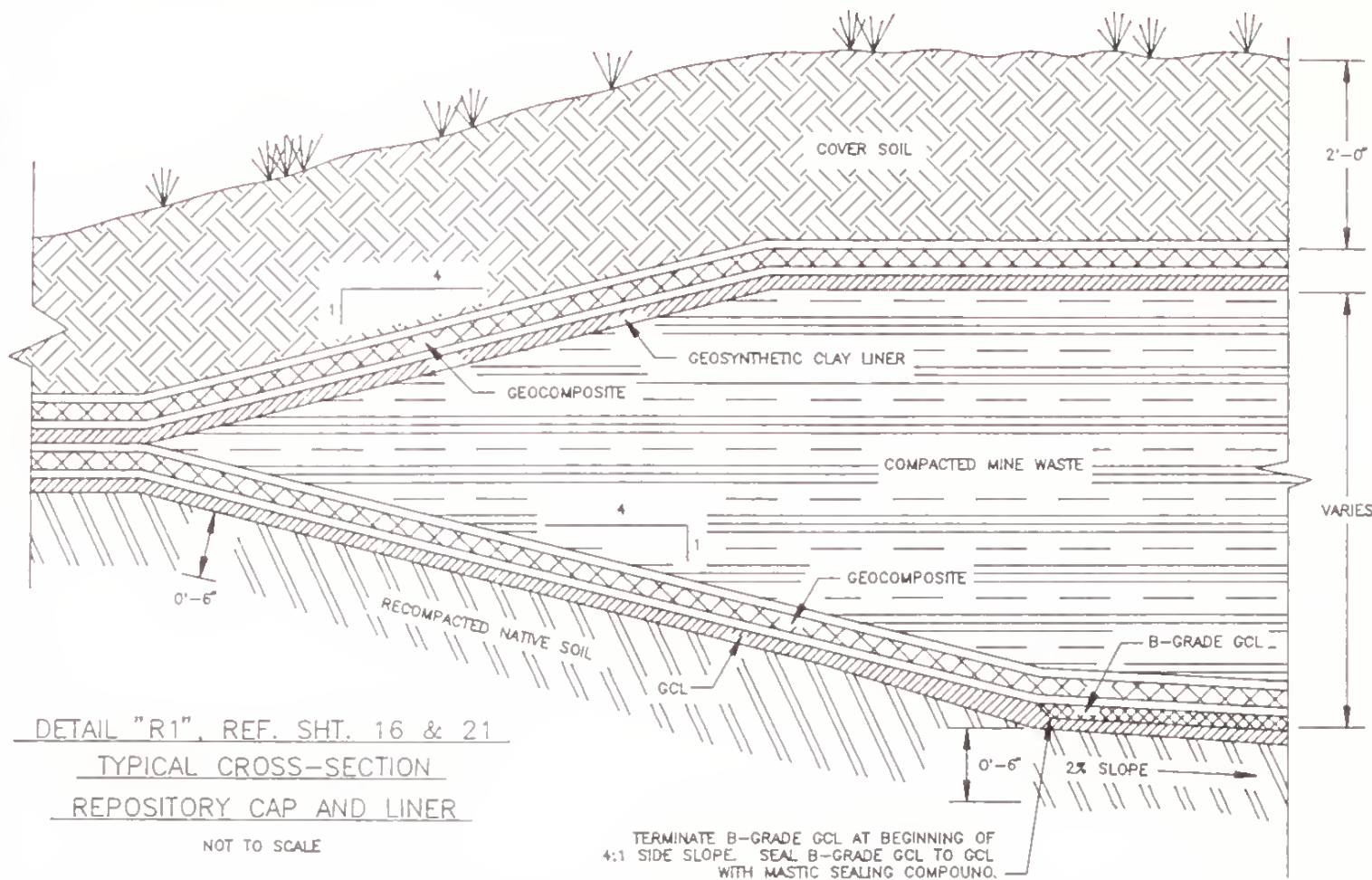
SHEET 14 OF 28

TITLE: BROOKLYN RECLAMATION  
FENCING PLAN

DRAWING NO.: PT340913 REV: --  
DATE: 6/22/95 PLOT SCALE: 1" = 200'







DESIGNED BY: BA & SB  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: WJB

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 15 OF 28

TITLE: BROOKLYN RECLAMATION  
REPOSITORY DETAILS  
(SHEET 1 OF 2)

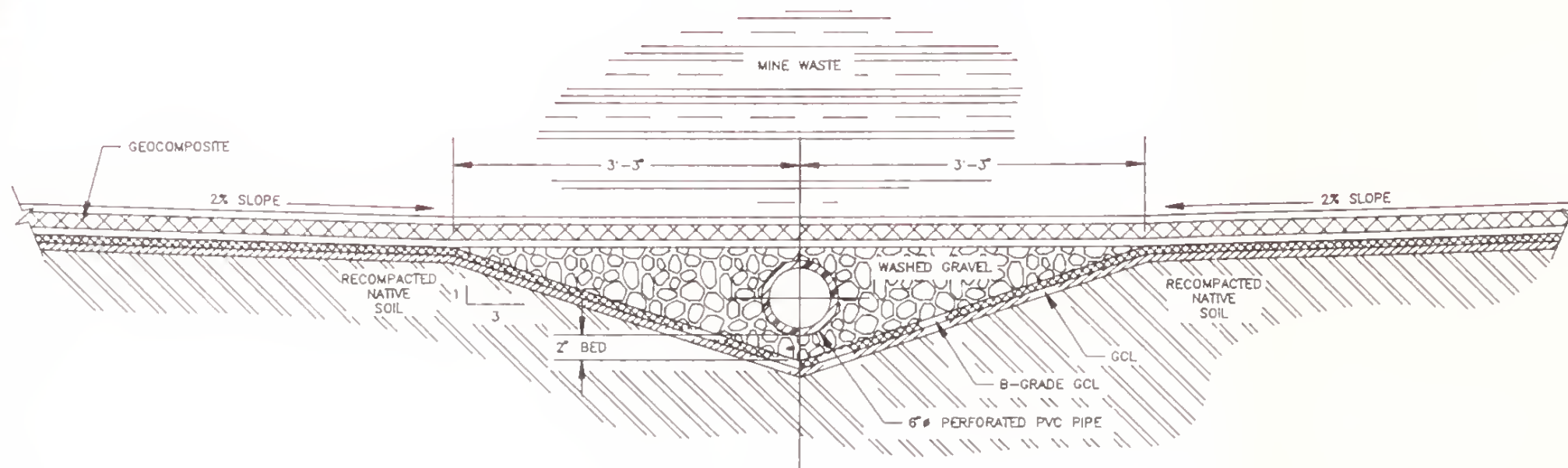
DRAWING NO.: PT340911 REV: -  
DATE: 6/22/95 PLOT SCALE: 1 = 1



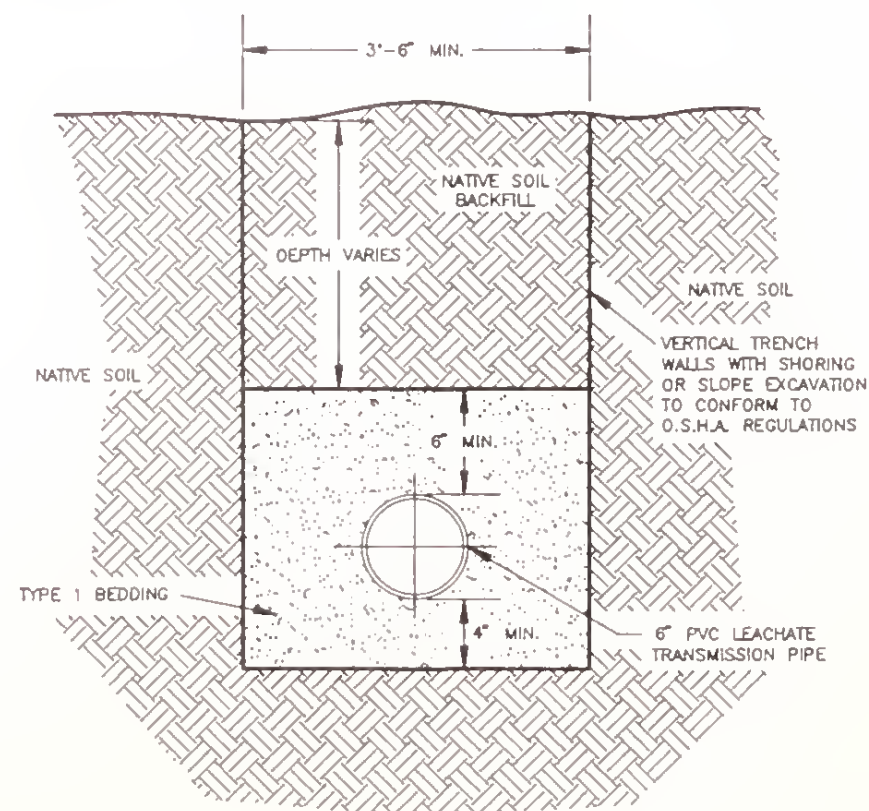




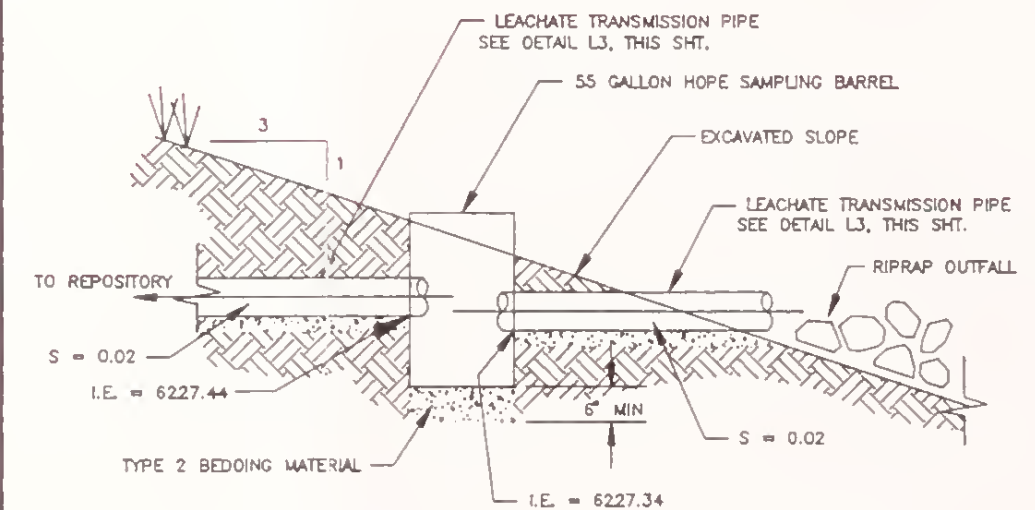




DETAIL "L2", REF. SHT. 5 & 21.  
TYPICAL CROSS-SECTION  
LEACHATE COLLECTION PIPE  
AND TRENCH  
NOT TO SCALE



DETAIL "L3", REF. SHT. 5, 6 & 16.  
LEACHATE  
TRANSMISSION PIPE SECTION  
NOT TO SCALE



NOTE  
CUT HOLES IN BARREL TO ALLOW LEACHATE TRANSMISSION PIPE TO  
PASS. SEAL PIPE TO BARREL WITH COUPLING AND GASKET OR  
SEALANT APPROVED BY THE ENGINEER.

DETAIL "L4", REF. SHT. 5, 6 & 16.  
HDPE SAMPLING BARREL DETAIL  
NOT TO SCALE

DESIGNED BY: BA & SB  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: WJB

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 17 OF 28

TITLE: BROOKLYN RECLAMATION  
LEACHATE COLLECTION DETAILS

DRAWING NO.: PT340912 REV: --  
DATE: 6/22/95 PLOT SCALE: 1 = 100

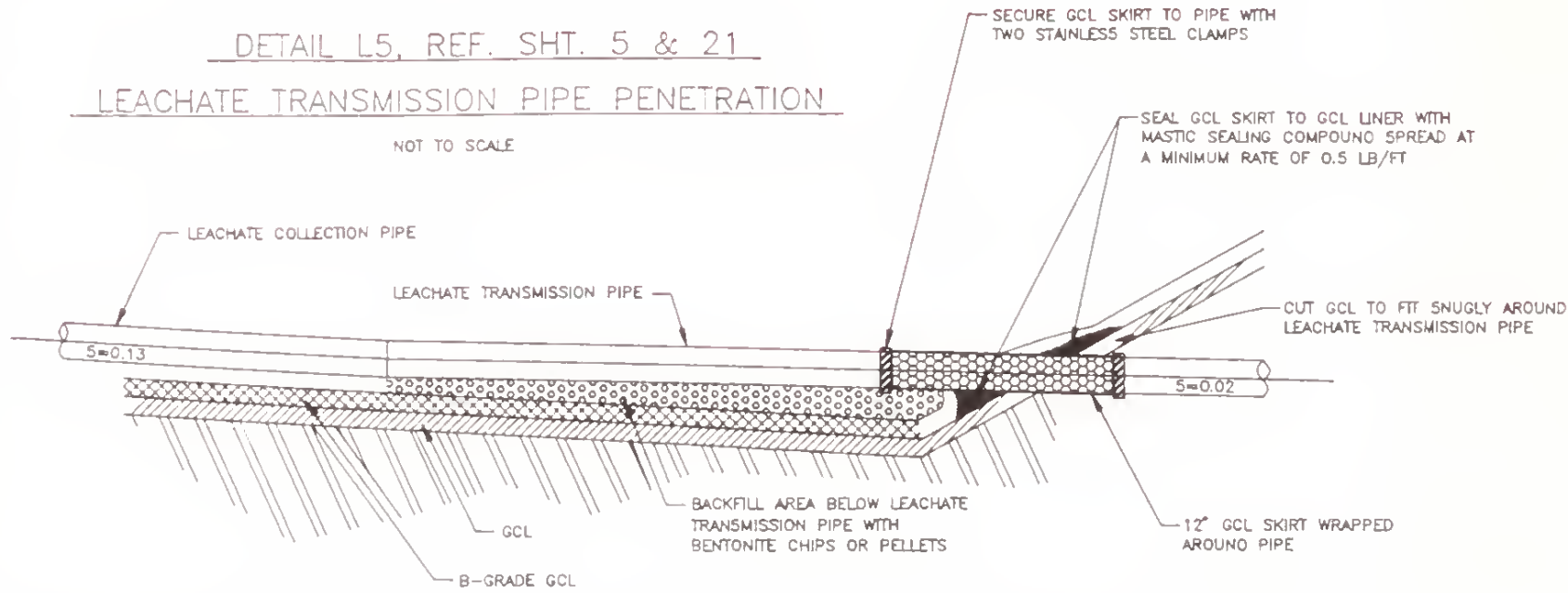




DETAIL L5, REF. SHT. 5 & 21

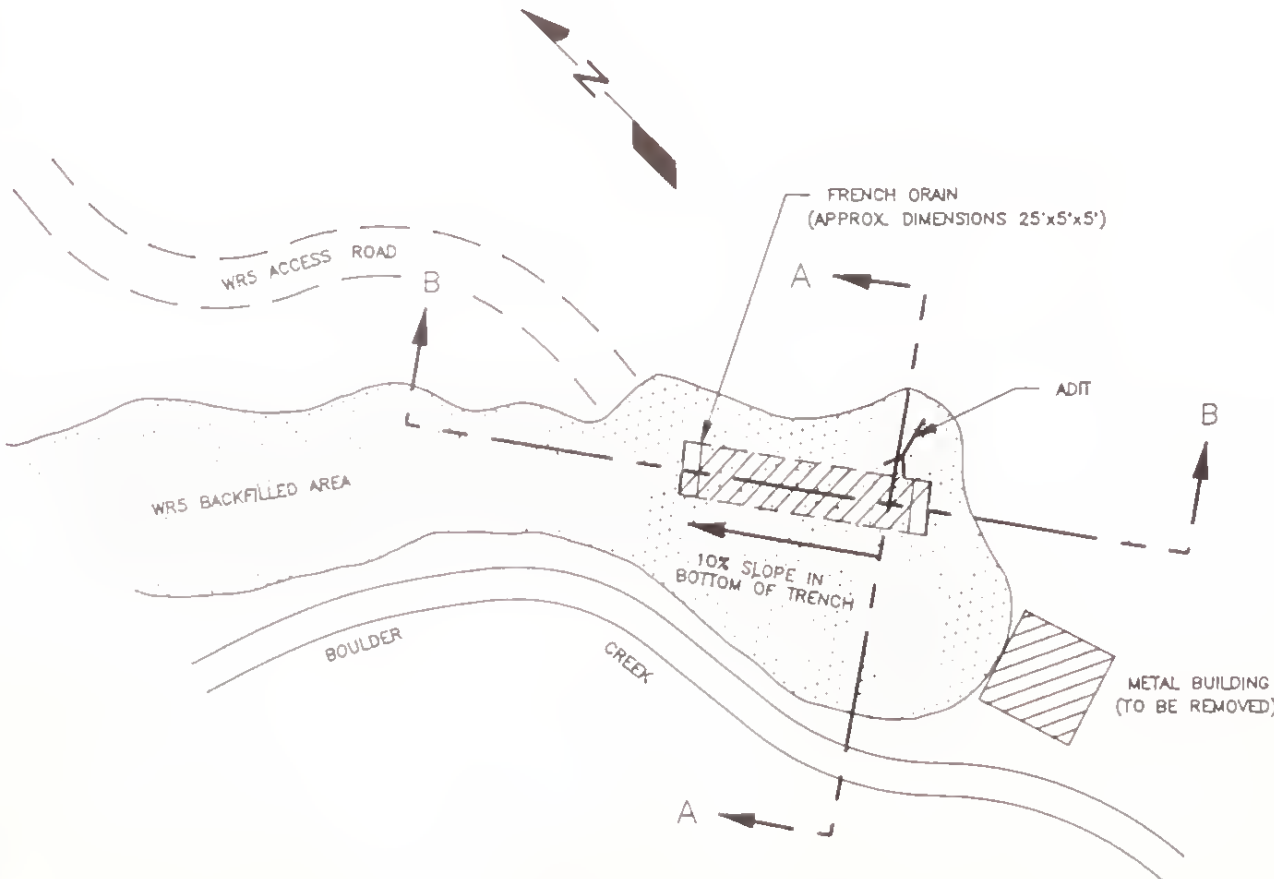
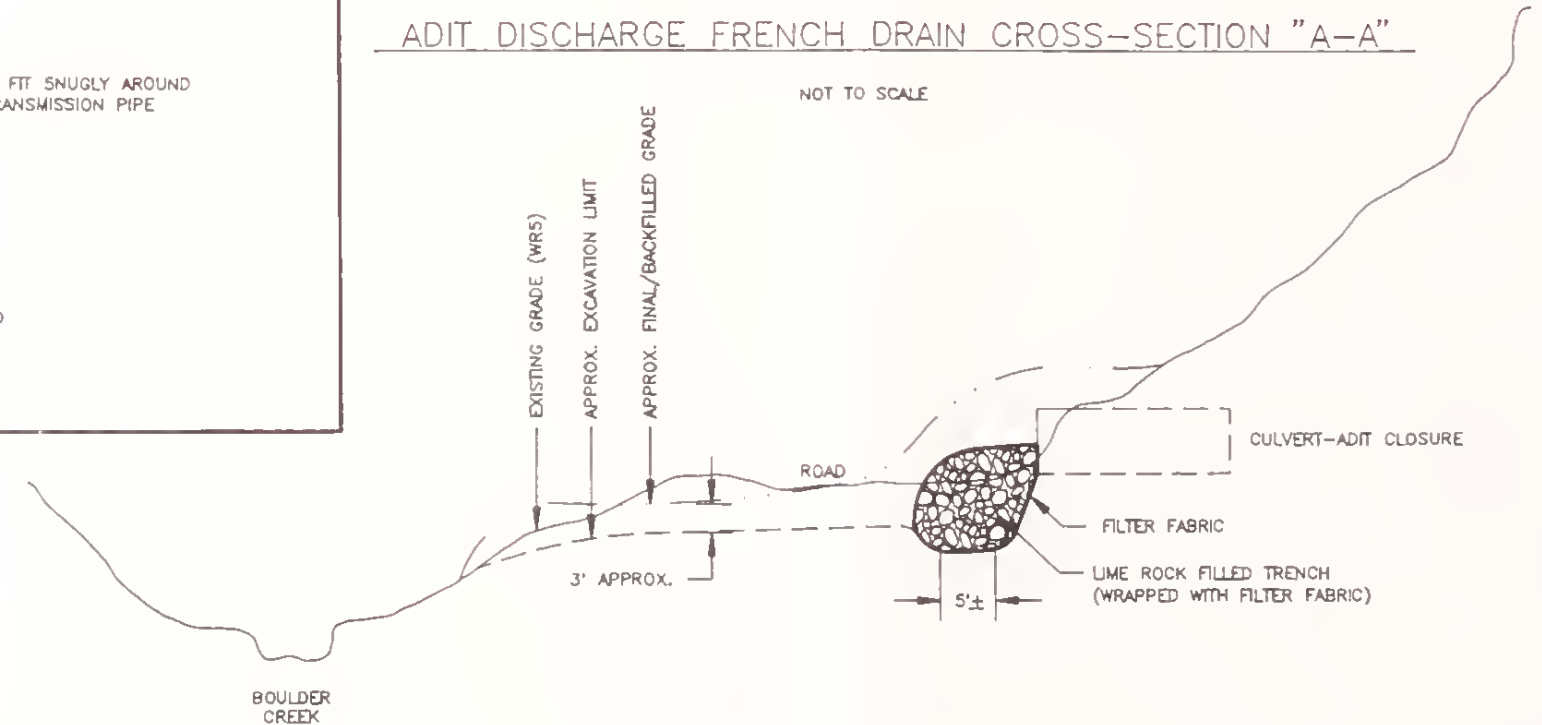
LEACHATE TRANSMISSION PIPE PENETRATION

NOT TO SCALE



ADIT DISCHARGE FRENCH DRAIN CROSS-SECTION "A-A"

NOT TO SCALE



DETAIL A1, REF. SHT. 7

ADIT DISCHARGE FRENCH DRAIN - PLAN VIEW

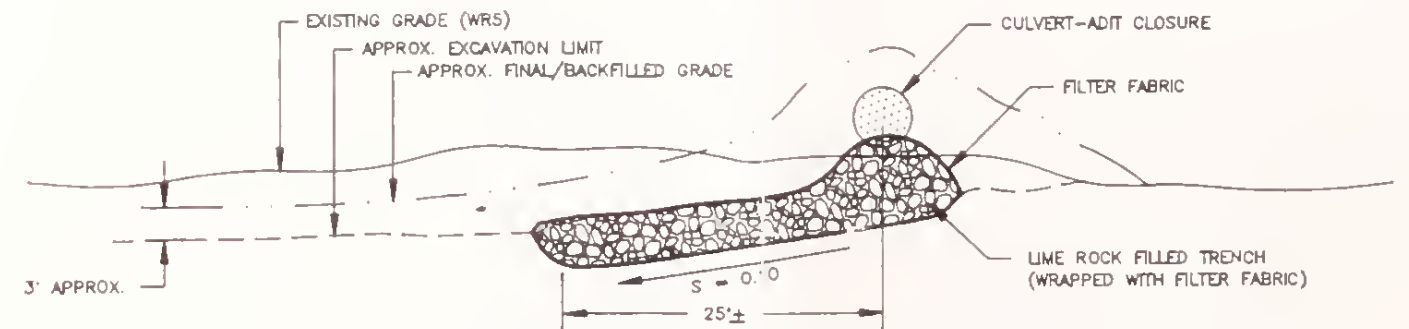
NOT TO SCALE

NOTES

1. ACTUAL FRENCH DRAIN LOCATION AND ELEVATIONS WILL BE DETERMINED AND STAKED IN THE FIELD, BY THE ENGINEER, AFTER WASTE ROCK PUMP #5 HAS BEEN EXCAVATED AND REMOVED.
2. INSTALL LIME ROCK (3"-6" GRADED SIZE) AT A MINIMUM DEPTH OF 5' IN TRENCH.
3. COVER AND LINE LIME ROCK DRAIN WITH FILTER FABRIC.
4. BACKFILL OVER LIME ROCK AND CULVERT CLOSURE WITH APPROXIMATELY 3' OF APPROVED COVER.
5. FERTILIZE, SEED, AND MULCH AREA IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

ADIT DISCHARGE FRENCH DRAIN CROSS-SECTION "B-B"

NOT TO SCALE



DESIGNED BY: BGA SDB  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: WJB

DRAWN FOR:

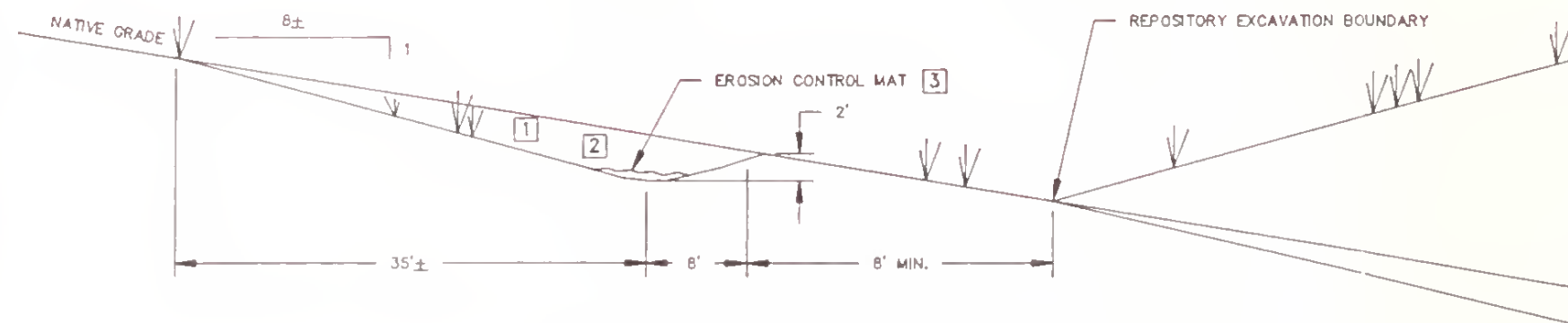
**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 18 OF 28

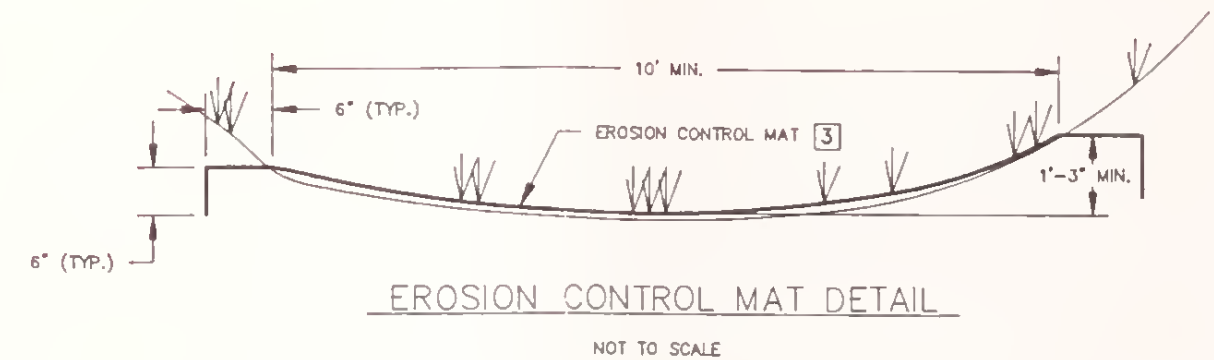
TITLE: BROOKLYN RECLAMATION  
LEACHATE COLLECTION DETAILS  
AND  
ADIT DISCHARGE FRENCH DRAIN

DRAWING NO.: PTJ40922 REV: -  
DATE: 6/22/95 PLOT SCALE: 1 = 1





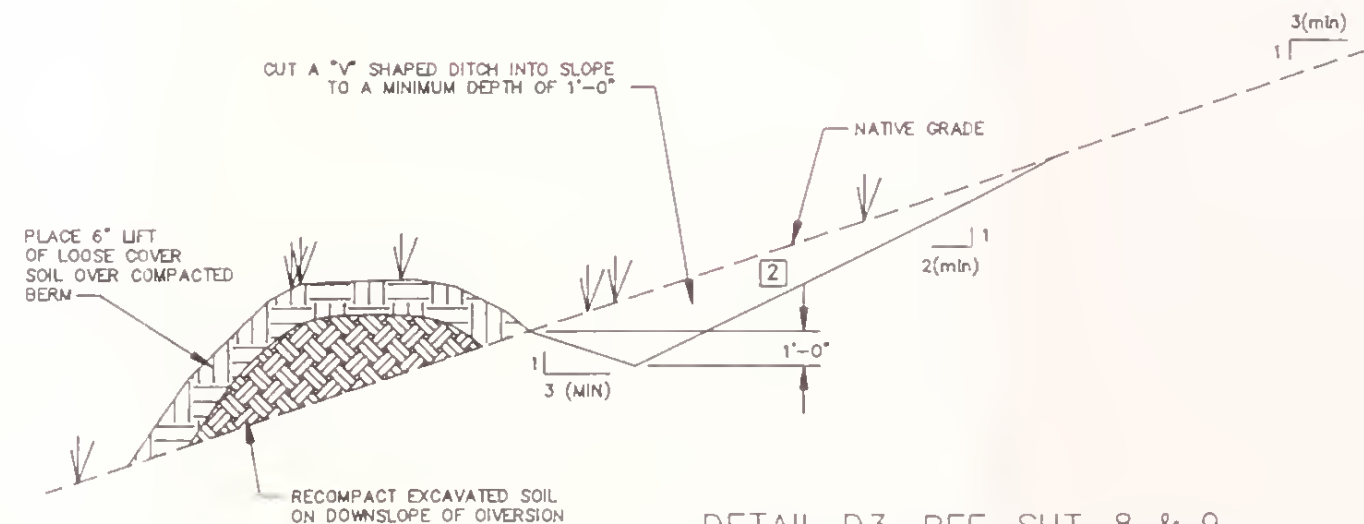
DETAIL D1, REF. SHT. 6  
REPOSITORY RUNON DIVERSION  
NOT TO SCALE



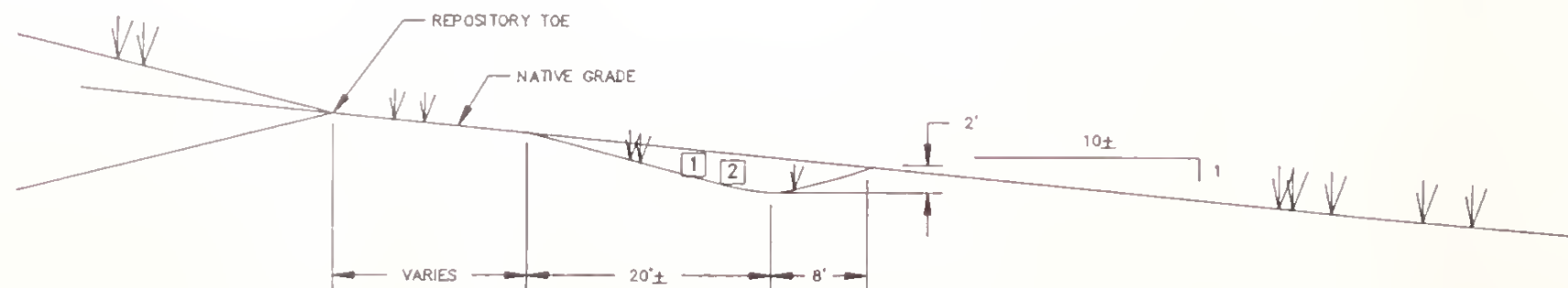
EROSION CONTROL MAT DETAIL  
NOT TO SCALE

NOTES

- 1 CUT DIVERSION SLOPES AT AN AVERAGE 4H:1V.
- 2 FERTILIZE, SEED, AND MULCH IN ACCORDANCE WITH THE SPECIAL PROVISIONS. ALL AREAS DISTURBED BY DIVERSION CONSTRUCTION.
- 3 INSTALL EROSION CONTROL MAT ALONG BOTTOM OF DIVERSION IN ACCORDANCE WITH SPECIAL PROVISIONS AND DETAILS SHOWN ON SHEET 26. ANCHOR MAT ON ALL SIDES IN ACCORDANCE WITH DETAIL ON THIS SHEET. ROLL MAT PARALLEL TO WATER FLOW DIRECTION.
4. USE SOIL EXCAVATED TO FORM DIVERSIONS FOR COVER SOIL IN ACCORDANCE WITH THE SPECIAL PROVISIONS.



DETAIL D3, REF. SHT. 8 & 9  
WASTE ROCK RUNON DIVERSION  
NOT TO SCALE

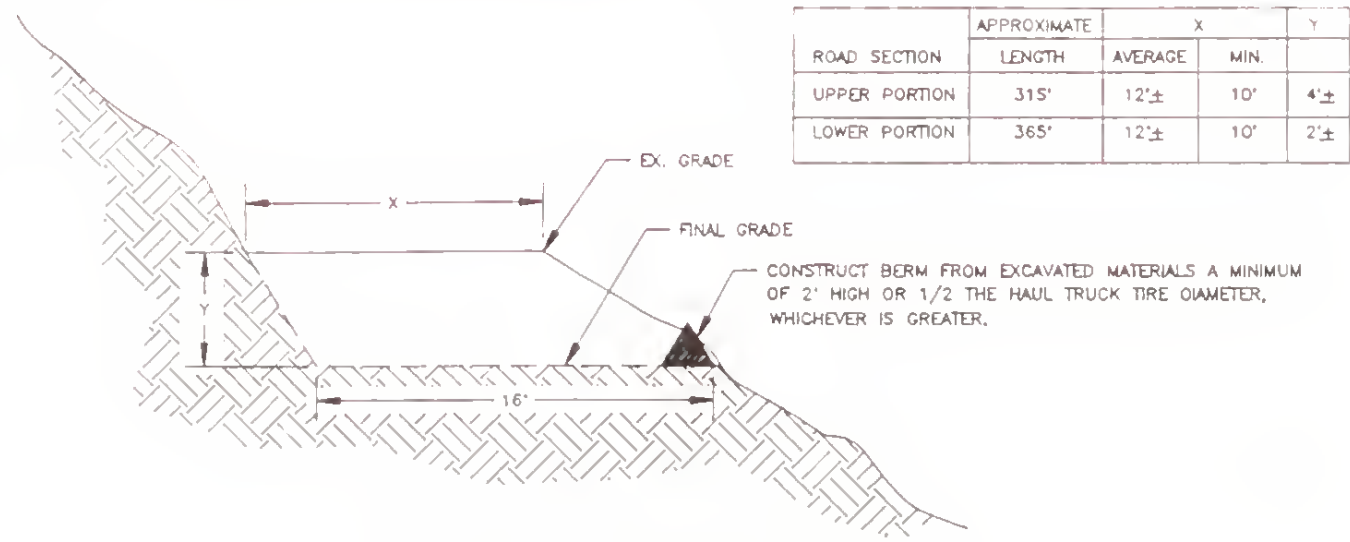


DETAIL D2, REF. SHT. 6  
REPOSITORY RUNOFF DIVERSION  
NOT TO SCALE

DESIGNED BY: BQA DRAWN BY: PRECISION DRAFTING SERVICES CHECKED BY: WJB	SHEET 19 OF 28
DRAWN FOR: <b>PIONEER</b> TECHNICAL SERVICES, INC. P.O. BOX 3446 BUTTE, MT 59702	TITLE: BROOKLYN RECLAMATION DRAINAGE DETAILS
DRAWING NO.: PT340923 DATE: 6/22/95	REV: - PLOT SCALE: 1 = 1

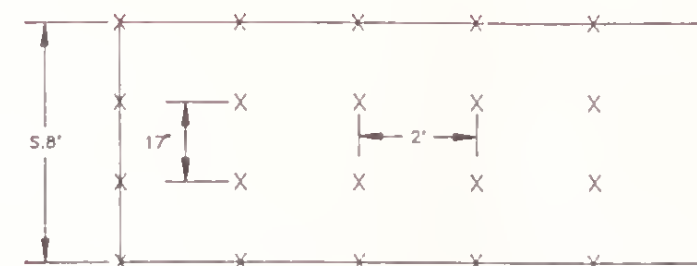




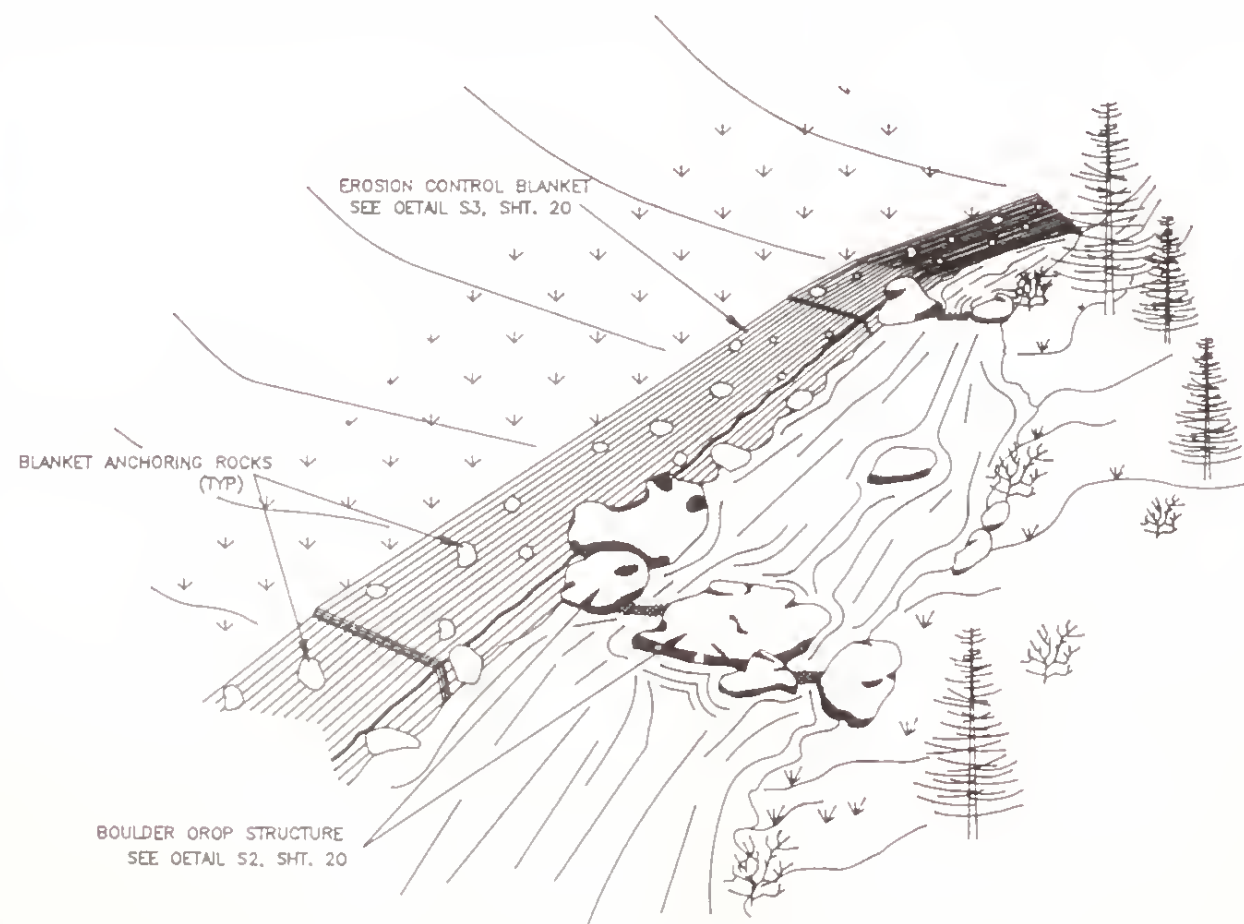


ROAD SECTION	APPROXIMATE LENGTH	X		Y
		AVERAGE	MIN.	
UPPER PORTION	315'	12'±	10'	4'±
LOWER PORTION	365'	12'±	10'	2'±

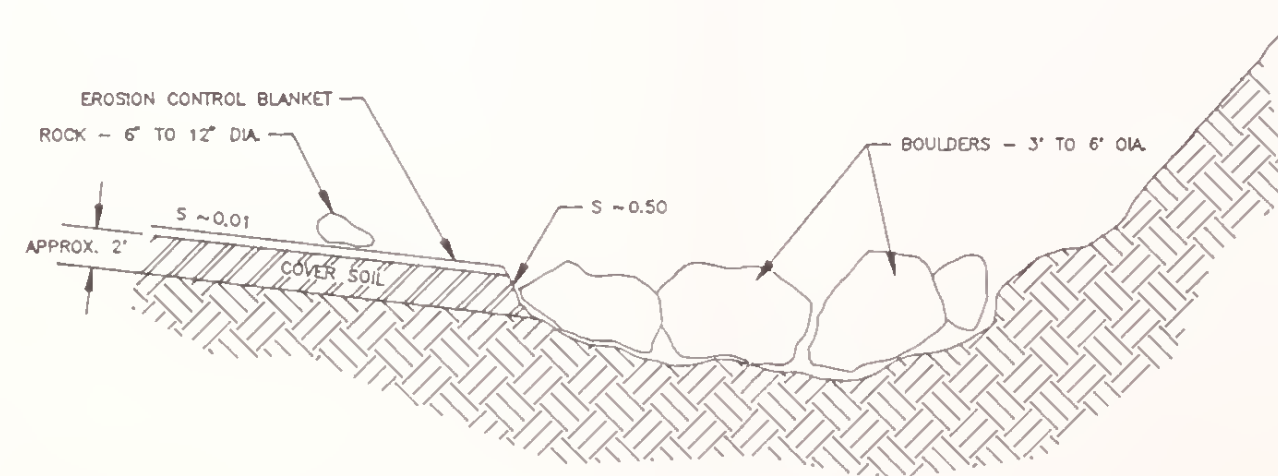
DETAIL "H1" REF. SHT. 4  
WR5 HAUL ROAD IMPROVEMENTS  
NOT TO SCALE



DETAIL "S3" REF. THIS SHT.  
EROSION CONTROL BLANKET STAKING DETAIL  
NOT TO SCALE



DETAIL "S1" REF. SHTS. 12 & 13  
CONCEPTUAL STREAM RECONSTRUCTION DETAIL  
NOT TO SCALE



DETAIL "S2" REF. SHTS. 12 & 13  
CONCEPTUAL STREAM RECONSTRUCTION CROSS SECTION  
NOT TO SCALE

DESIGNED BY: WJB  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

DRAWN FOR:

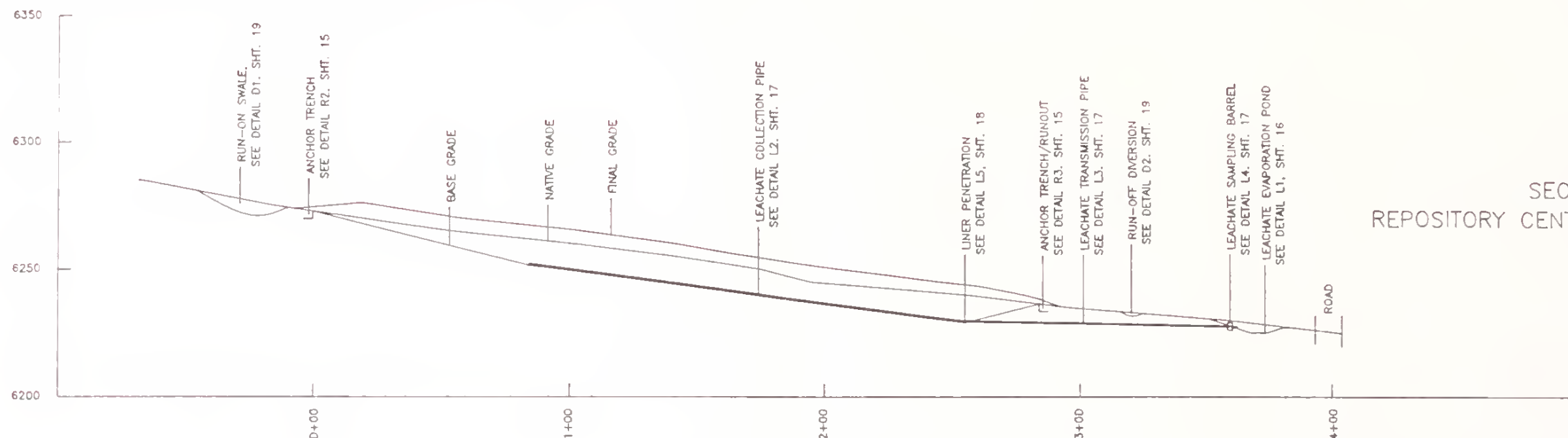
**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 20 OF 28

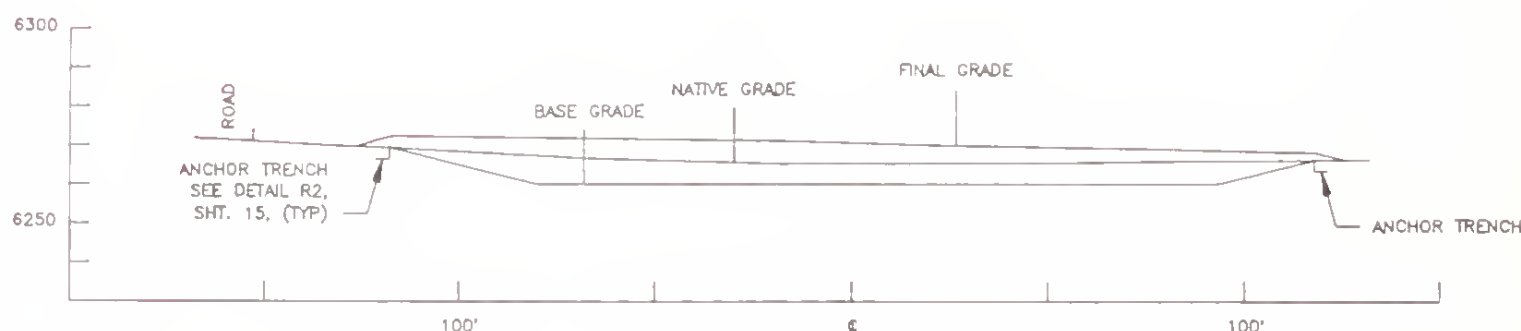
TITLE: BROOKLYN RECLAMATION  
STREAM RESTORATION

DRAWING NO.: PT340936 REV: -  
DATE: 6/25/95 PLOT SCALE: 1 = 1

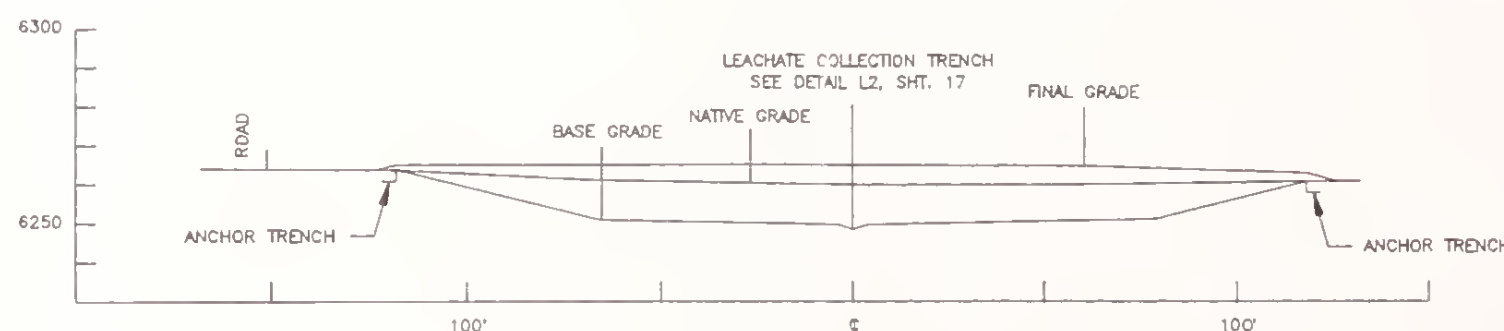




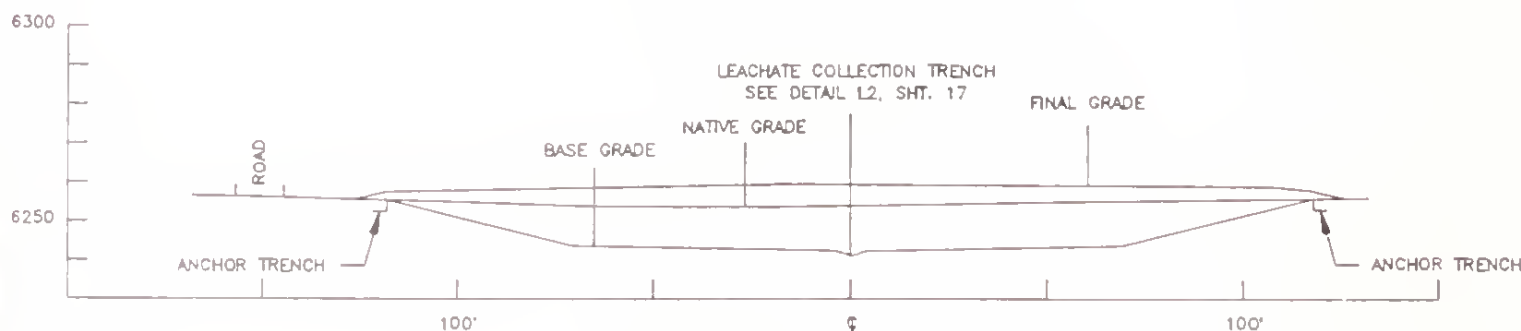
SECTION A  
REPOSITORY CENTERLINE PROFILE



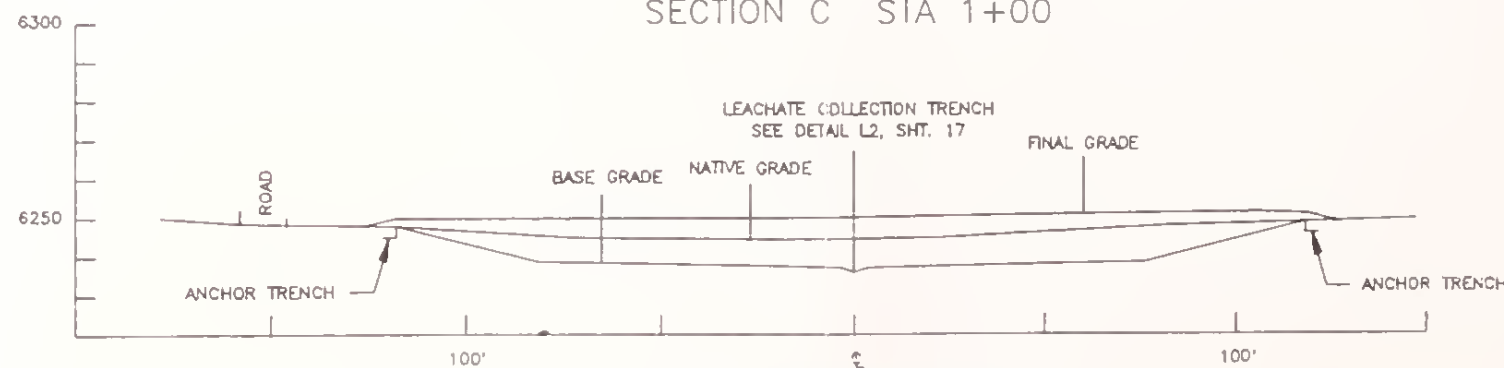
SECTION B STA 0+50



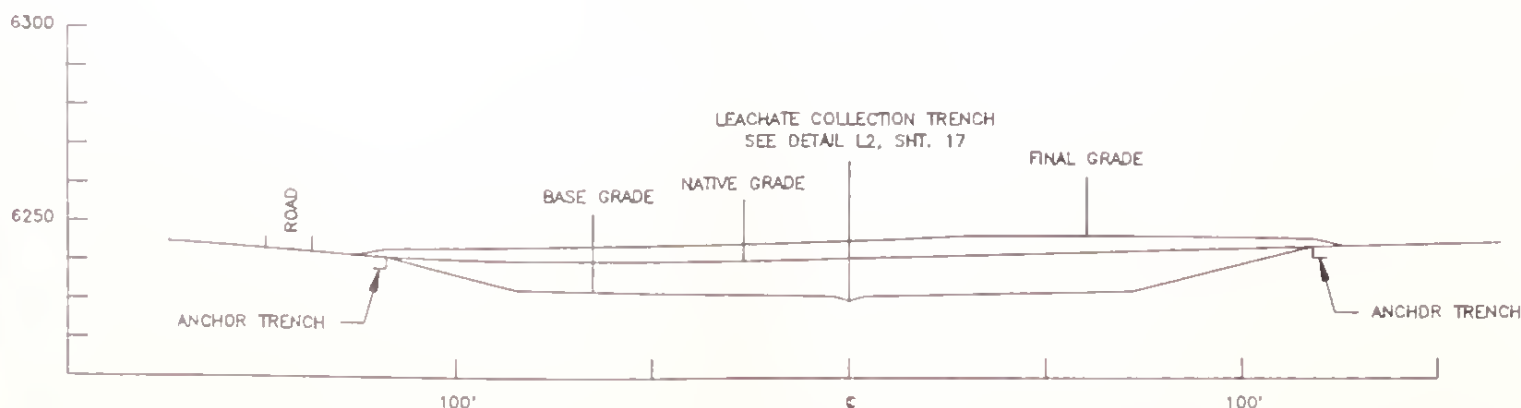
SECTION C STA 1+00



SECTION D STA 1+50



SECTION E STA 2+00



SECTION F STA 2+50

DESIGNED BY: BOA	SHEET 21 OF 28
DRAWN BY: PRECISION DRAFTING SERVICES	
CHECKED BY: WJB	
DRAWN FOR:	TITLE: BROOKLYN RECLAMATION
<b>PIONEER</b>	REPOSITORY CROSS SECTIONS
TECHNICAL SERVICES, INC.	
P.O. BOX 3445	DRAWING NO.: PT340918 REV: -
BUTTE, MT 59702	DATE: 6/22/95 PLOT SCALE: 1" = 50'







APPROXIMATELY

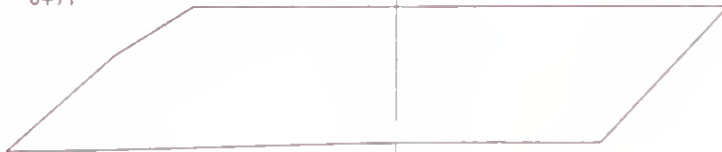
CL

CL

CL

CL

0+71



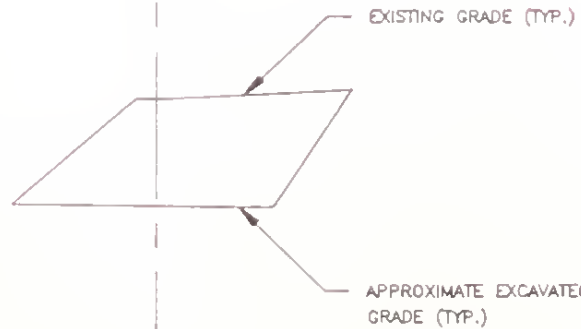
0+55



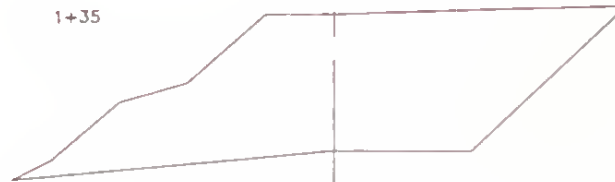
0+35



STA.  
0+00



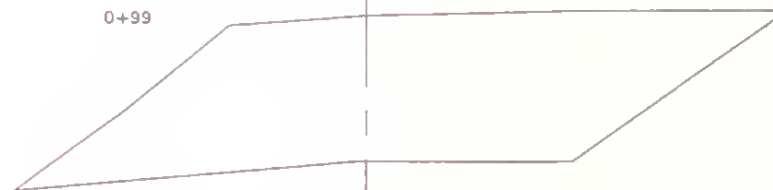
1+35



1+14



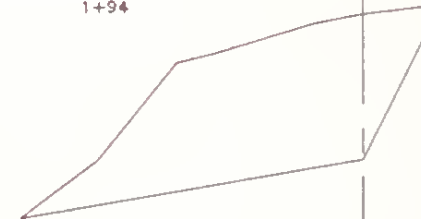
0+99



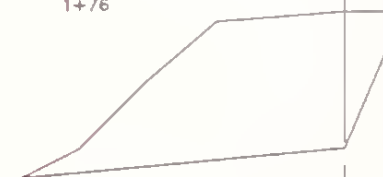
0+81



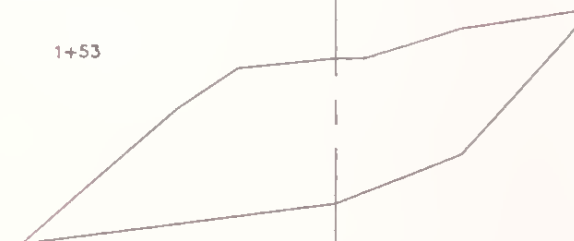
1+94



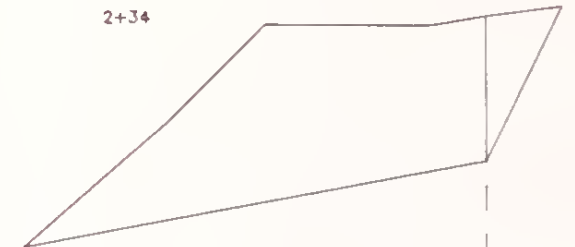
1+76



1+53



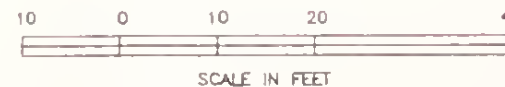
2+34



2+15



2+04



SCALE IN FEET

DESIGNED BY: DRC  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 22 OF 28

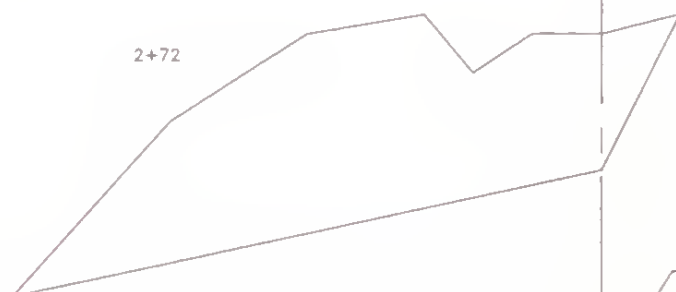
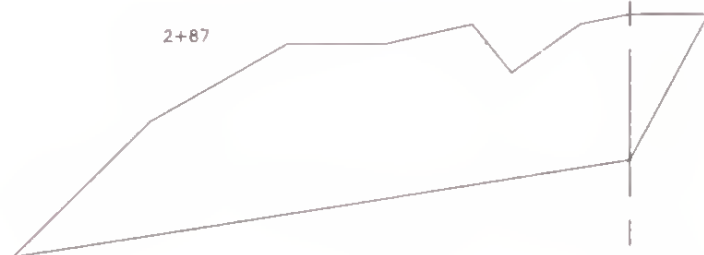
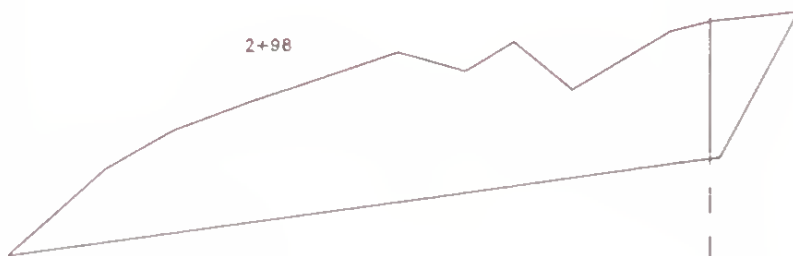
TITLE: BROOKLYN RECLAMATION  
WR5 CROSS-SECTIONS  
(1 OF 2)

DRAWING NO.: PT340919 REV: -  
DATE: 6/22/95 PLOT SCALE: 1" = 20'

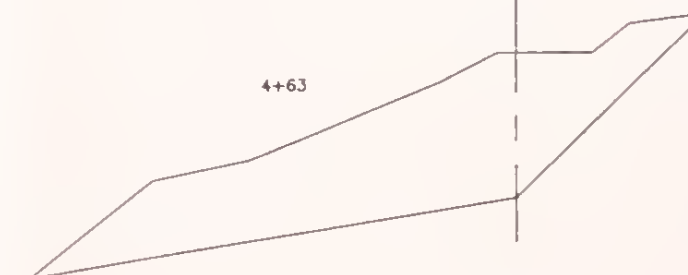
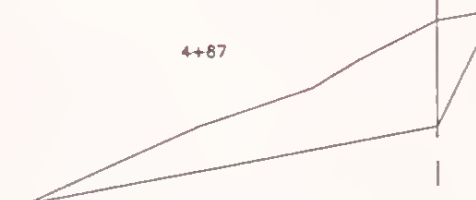
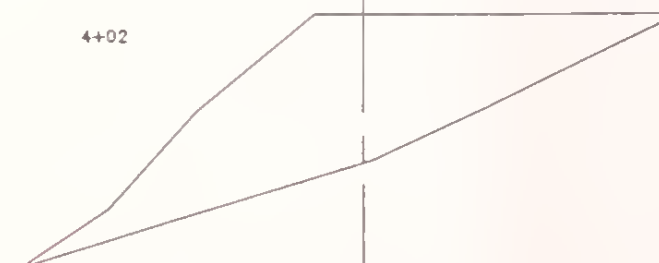
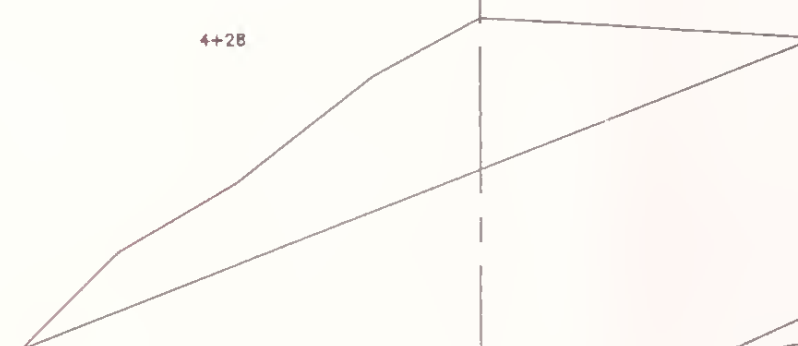
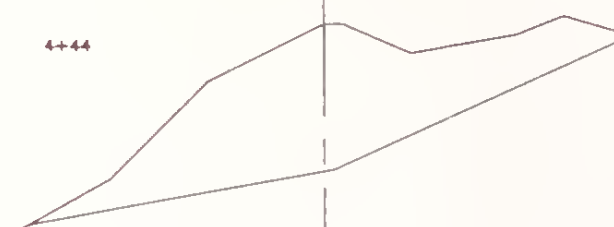
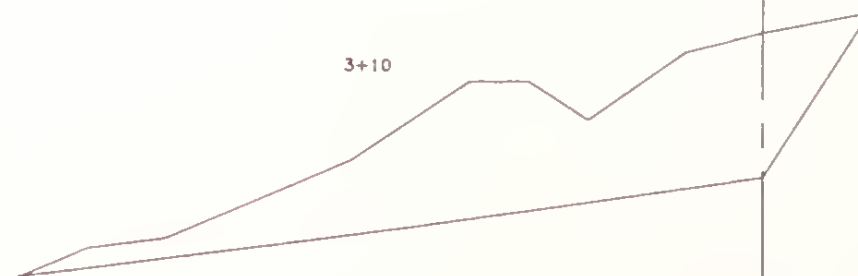
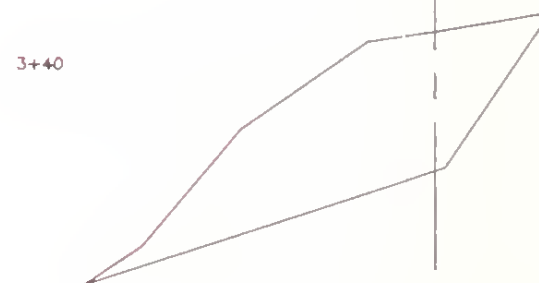
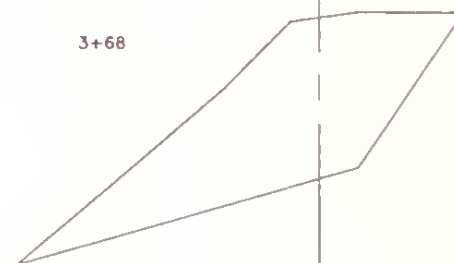
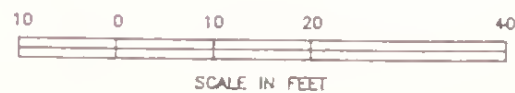




APPROXIMATELY



STA.  
2+53



DESIGNED BY: DRC  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

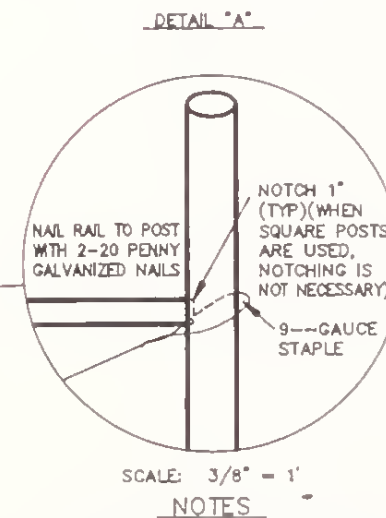
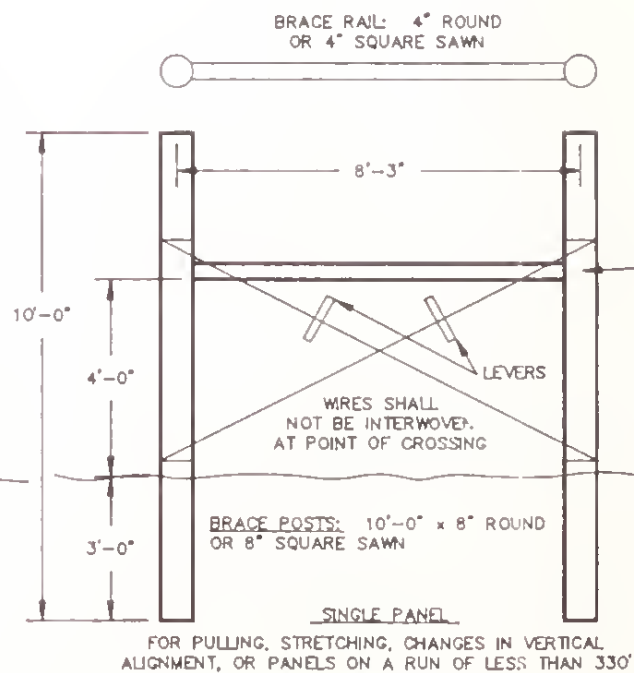
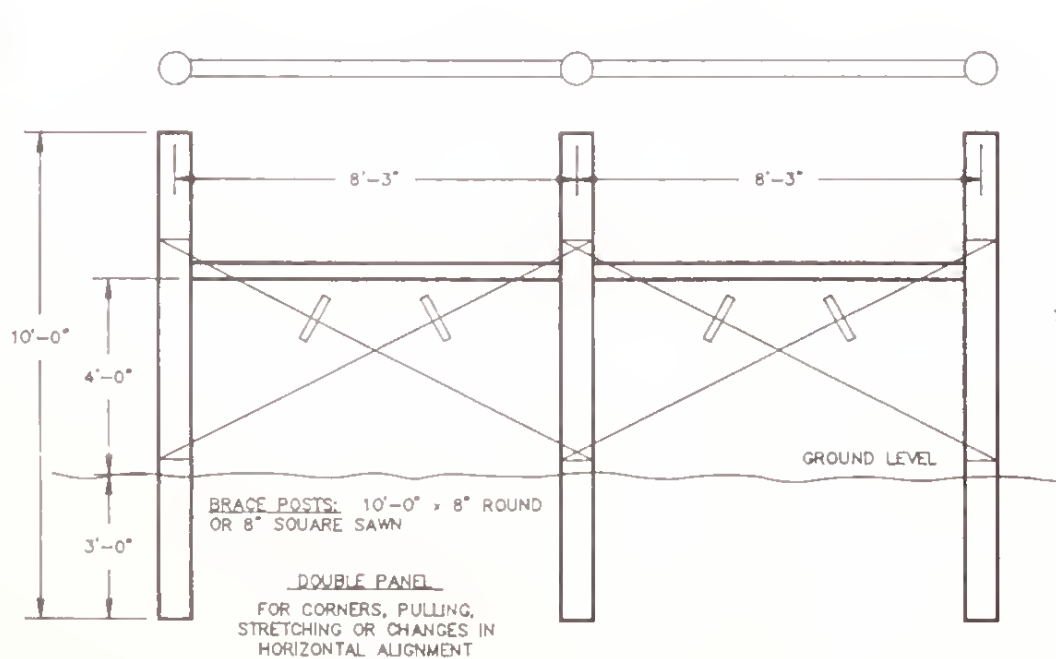
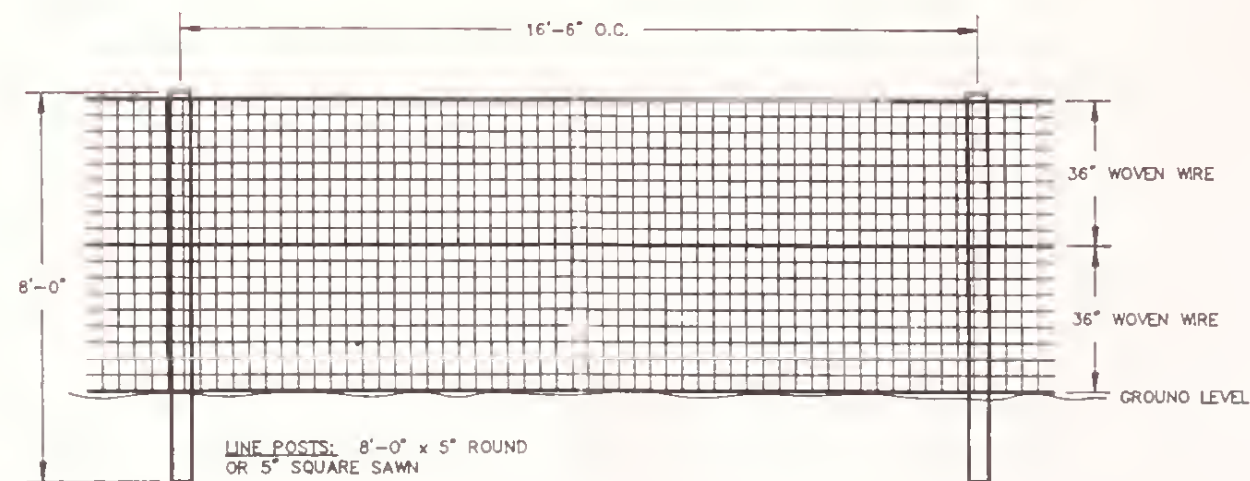
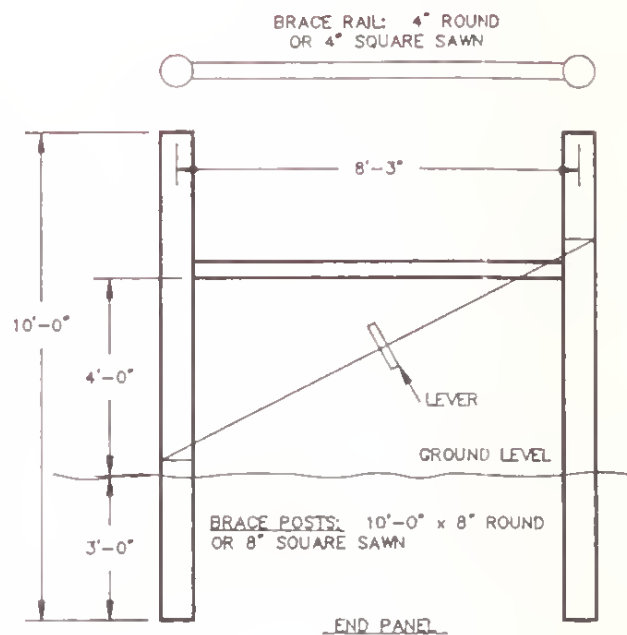
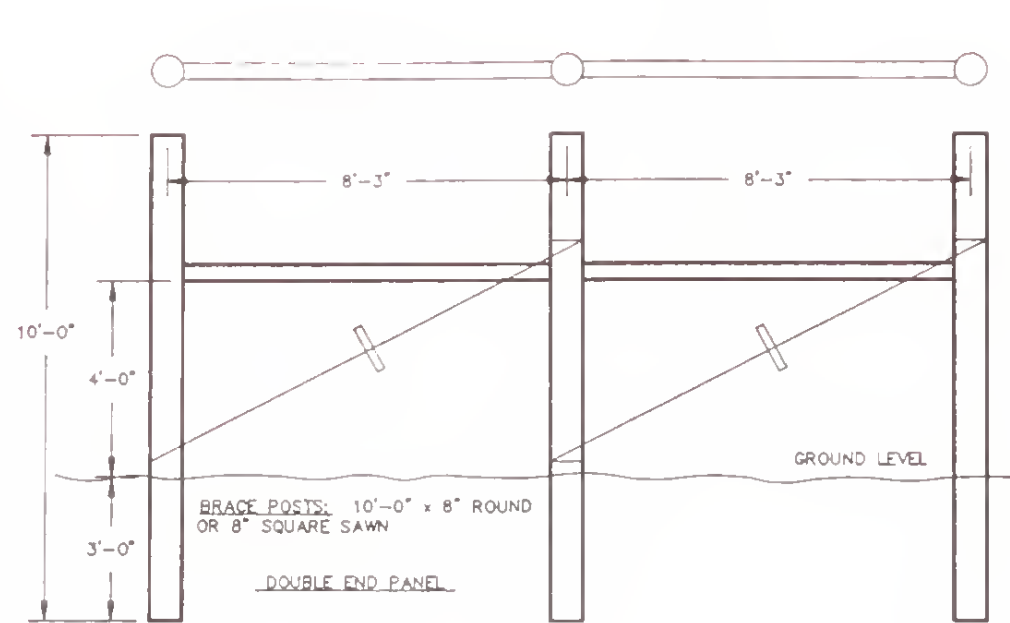
SHEET 23 OF 28

TITLE: BROOKLYN RECLAMATION  
WR5 CROSS-SECTIONS  
(2 OF 2)

DRAWING NO.: PT340920 REV: -  
DATE: 6/22/95 PLOT SCALE: 1" = 20'







- NOTES**
1. BRACE WRES - ONE CONTINUOUS 9-GAUGE SMOOTH WIRE, DOUBLED TO FORM A FOUR WIRE BRACE. THE TWO ENDS SHALL BE TIED NEAR THE TOP OF THE PANEL POSTS.
  2. LEVERS - 1 1/2" x 2" x 12" MINIMUM SIZE.

#### FENCING NOTES

1. FENCING DETAILS SCALE: 1/4" = 1'.
2. POST SPACING MEASURED GENERALLY TO GROUND.
3. LINE POST SPACING IS 16'-6" ON CENTER. LINE POST SPACING FROM BRACE OR PANEL POSTS IS 16'-6" ON CENTER.
4. STAPLE THE BOTTOM, TOP, CENTER AND ALTERNATE WRES OF WOVEN WIRE TO ALL WOOD LINE POSTS.
5. STAPLE ALL WRES OF WOVEN WIRE TO WOOD CORNER POSTS OR POST USED TO TIE OFF WIRE.
6. A DEADMAN MAY BE A PRECAST BLOCK, A CAST IN PLACE CONCRETE BLOCK, A ROCK OR OTHER APPROVED OBJECT WEIGHING AT LEAST 150 POUNDS. THE DEADMAN SHALL BE BURIED IN THE GROUND AND HAVE AT LEAST 2' OF COVER. THE DEADMAN SHALL BE ATTACHED TO FENCE WITH 3 STRANDS OF 9-GAUGE WIRE.
7. THE GAP BETWEEN THE BOTTOM OF THE LOWEST WOVEN WIRE PANEL AND THE GROUND SURFACE SHALL BE NO GREATER THAN 6-INCHES.

DESIGNED BY: S. BISCH  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

DRAWN FOR:

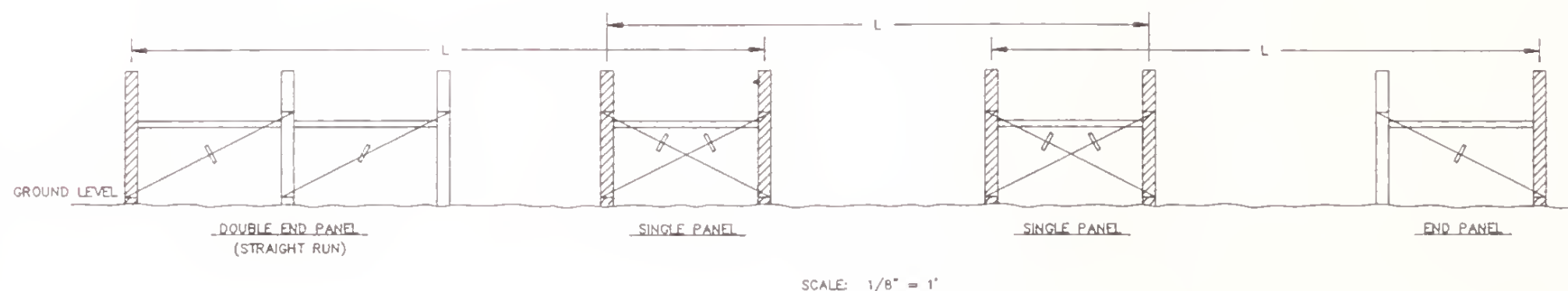
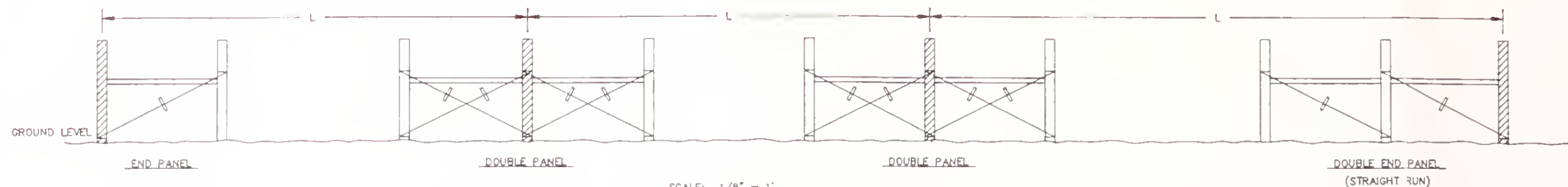
**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3446  
BUTTE, MT 59702

SHEET 24 OF 28

TITLE: BROOKLYN RECLAMATION  
FENCING DETAILS  
(1 OF 2)

DRAWING NO.: PT340914 REV: -  
DATE: 6/22/95 PLOT SCALE: 1" = 48'

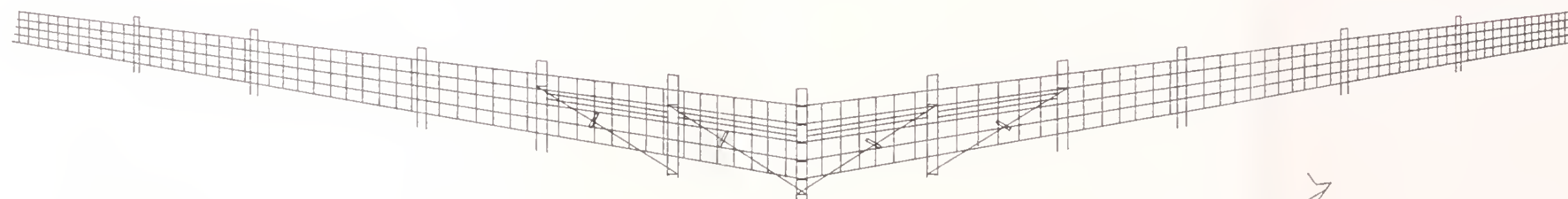




FENCE TYPE	RUN = L	PANELS REQUIRED
WOVEN WIRE	33' OR LESS	NONE
	33' - 330'	SINGLE OR END
	OVER 330' 'ID MAX. 660'	DOUBLE

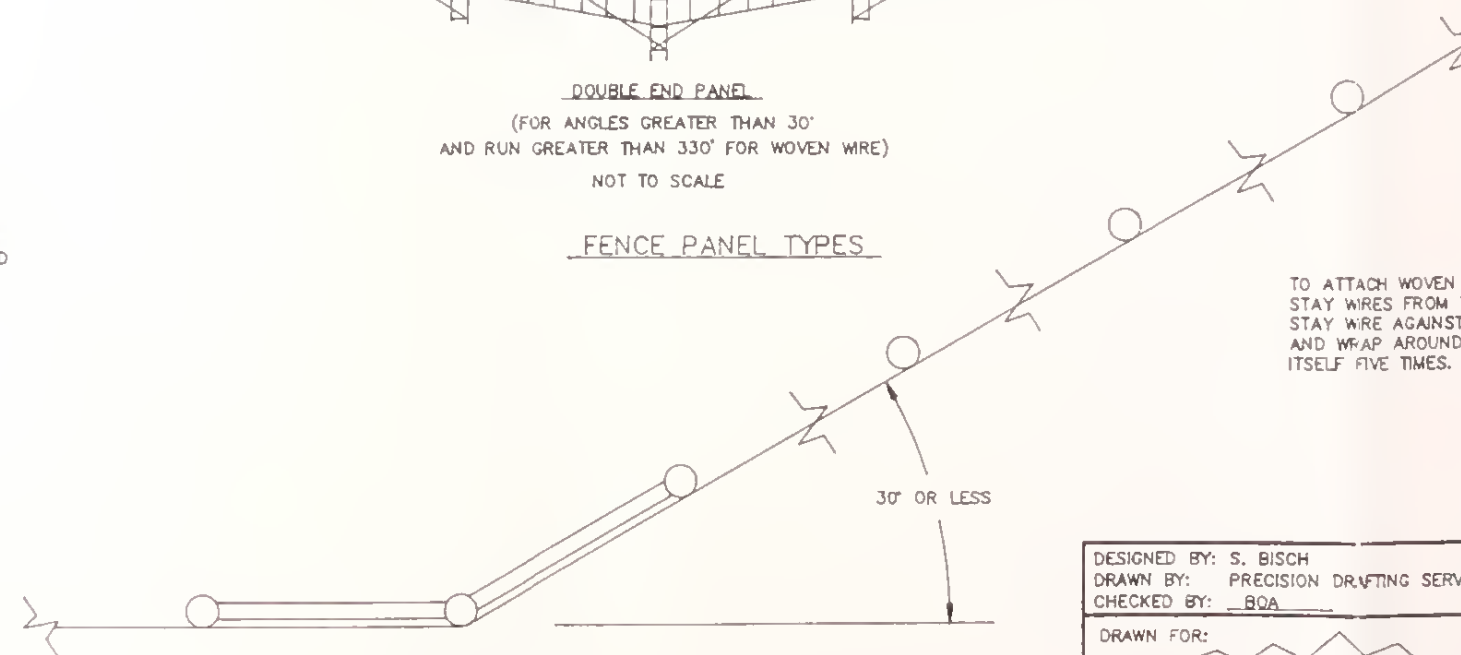
#### NOTES

1. DOUBLE END PANELS SHALL BE USED ONLY WHEN THE ANGLE IS GREATER THAN 30° AND THE RUN REQUIRES A DOUBLE PANEL.
2. TIE OFF ON ALL CROSS HATCHED POSTS. END PANELS REQUIRE BRACE WIRES ONLY IN ONE DIRECTION.

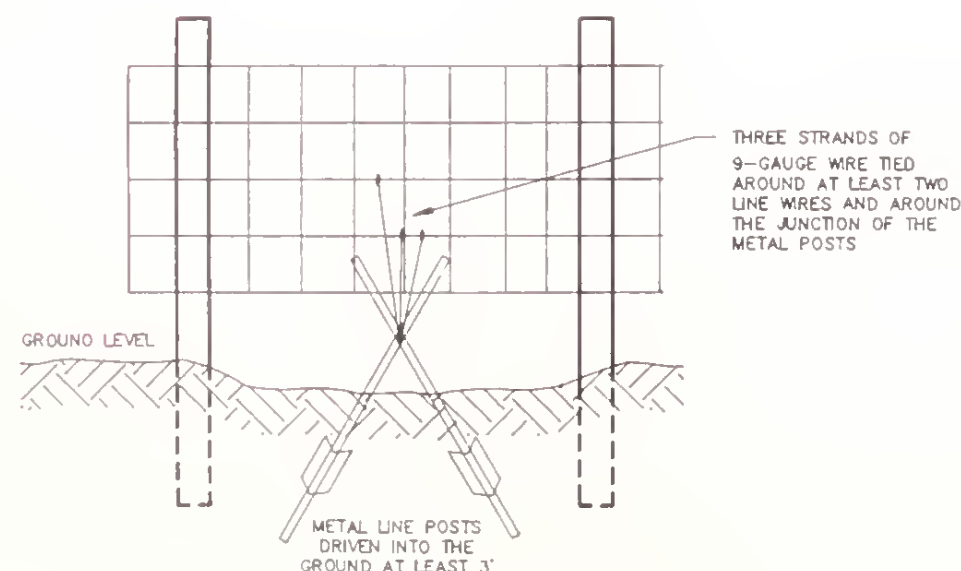


DOUBLE END PANEL  
(FOR ANGLES GREATER THAN 30°  
AND RUN GREATER THAN 330' FOR WOVEN WIRE)  
NOT TO SCALE

#### FENCE PANEL TYPES



FENCE CORNER ANGLE  
ANGLES SHALL BE  
DETERMINED BY THIS DETAIL  
NOT TO SCALE



WHEN APPROVED BY THE ENGINEER, THE ABOVE DEADMAN  
MAY BE USED IN LIEU OF A ROCK OR PRECAST CONCRETE  
BLOCK, AS SPECIFIED.

SCALE:  $1/4" = 1'$

#### NOTES

TO ATTACH WOVEN WIRE TO END POST, REMOVE TWO OR THREE VERTICAL  
STAY WIRES FROM THE END OF THE FENCE. PLACE FIRST COMPLETE VERTICAL  
STAY WIRE AGAINST POST. START AT MIDDLE OF HORIZONTAL LINE WIRES  
AND WRAP AROUND END POST AT LEAST TWO TIMES AND THEN WRAP WIRE AROUND  
ITSELF FIVE TIMES.

DESIGNED BY: S. BISCH  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3446  
BUTTE, MT 59702

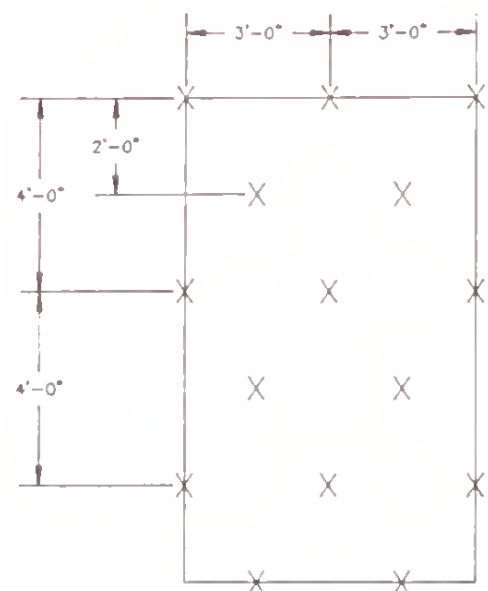
SHEET 25 OF 28

TITLE: BROOKLYN RECLAMATION  
FENCING DETAILS  
(2 OF 2)

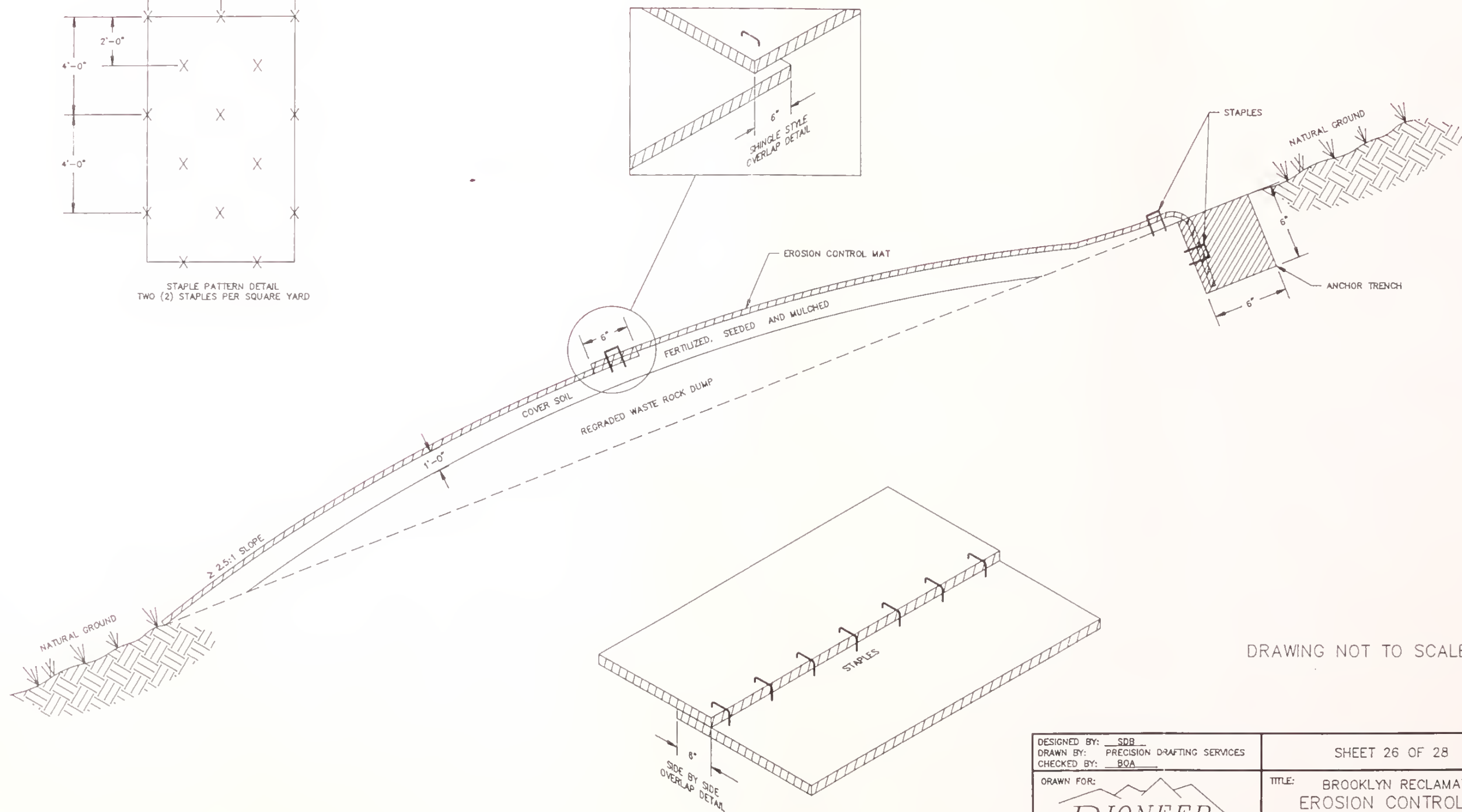
DRAWING NO.: PT34091S REV: -  
DATE: 6/22/95 PLOT SCALE: 1 = 48








STAPLE PATTERN DETAIL  
TWO (2) STAPLES PER SQUARE YARD



DRAWING NOT TO SCALE

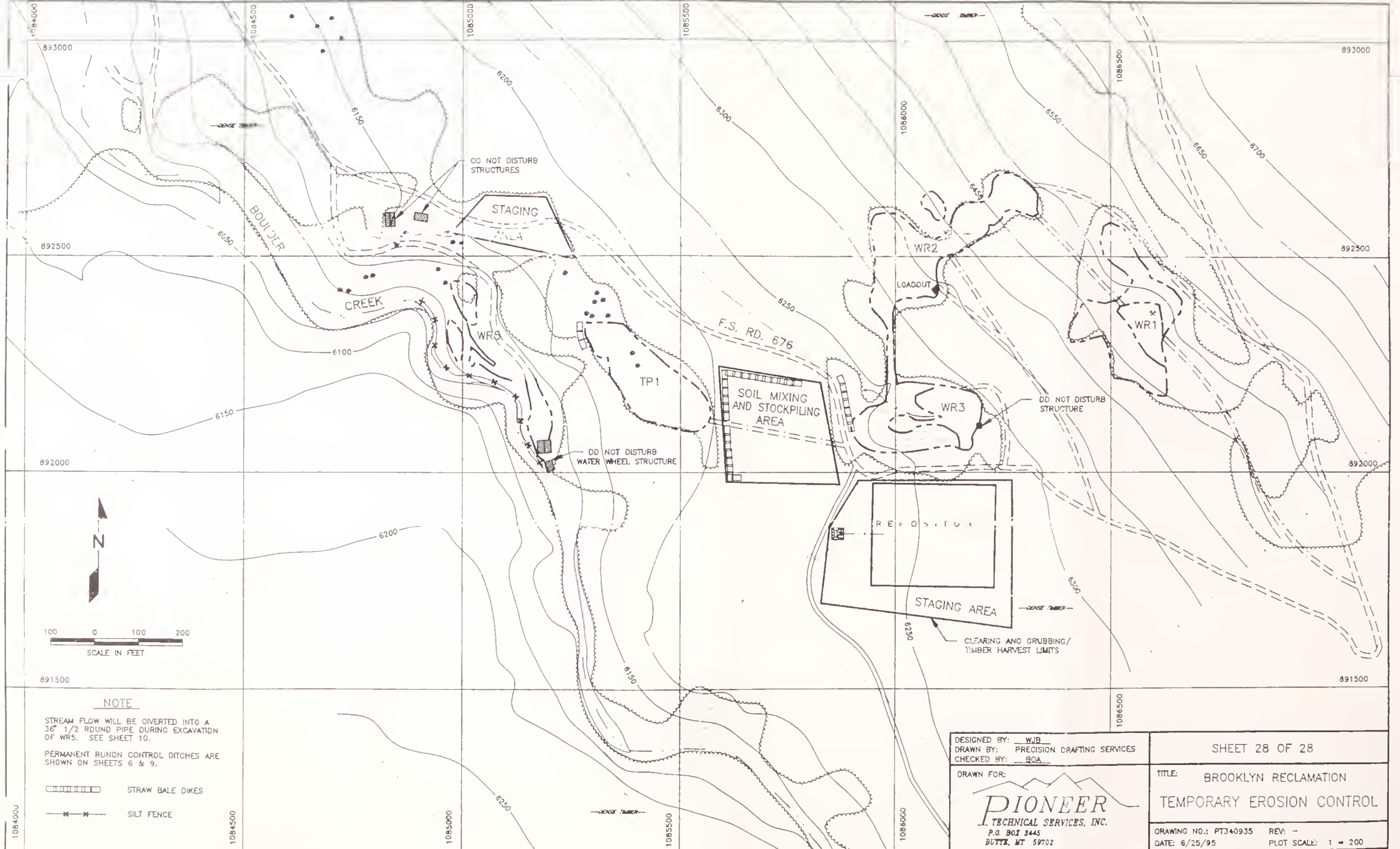
DESIGNED BY: SDB	SHEET 26 OF 28
DRAWN BY: PRECISION DRAFTING SERVICES	
CHECKED BY: BOA	
DRAWN FOR:	TITLE: BROOKLYN RECLAMATION EROSION CONTROL MAT INSTALLATION DETAILS
 <b>PIONEER</b> TECHNICAL SERVICES, INC. P.O. BOX 3446 BUTTE, MT 59702	DRAWING NO.: PT340926 REV: - DATE: 6/22/95 PLOT SCALE: 1 = 1











NOTE

STREAM FLOW WILL BE OVERTED INTO A 36" 1/2 ROUND PIPE DURING EXCAVATION OF WR5. SEE SHEET 10.

PERMANENT RUNON CONTROL DITCHES ARE SHOWN ON SHEETS 6 & 9.

-  STRAW BALE DIKES
-  SILT FENCE

DESIGNED BY: WJB  
DRAWN BY: PRECISION DRAFTING SERVICES  
CHECKED BY: BOA

DRAWN FOR:

**PIONEER**  
TECHNICAL SERVICES, INC.  
P.O. BOX 3445  
BUTTE, MT 59702

SHEET 28 OF 28

TITLE: **BROOKLYN RECLAMATION  
TEMPORARY EROSION CONTROL**

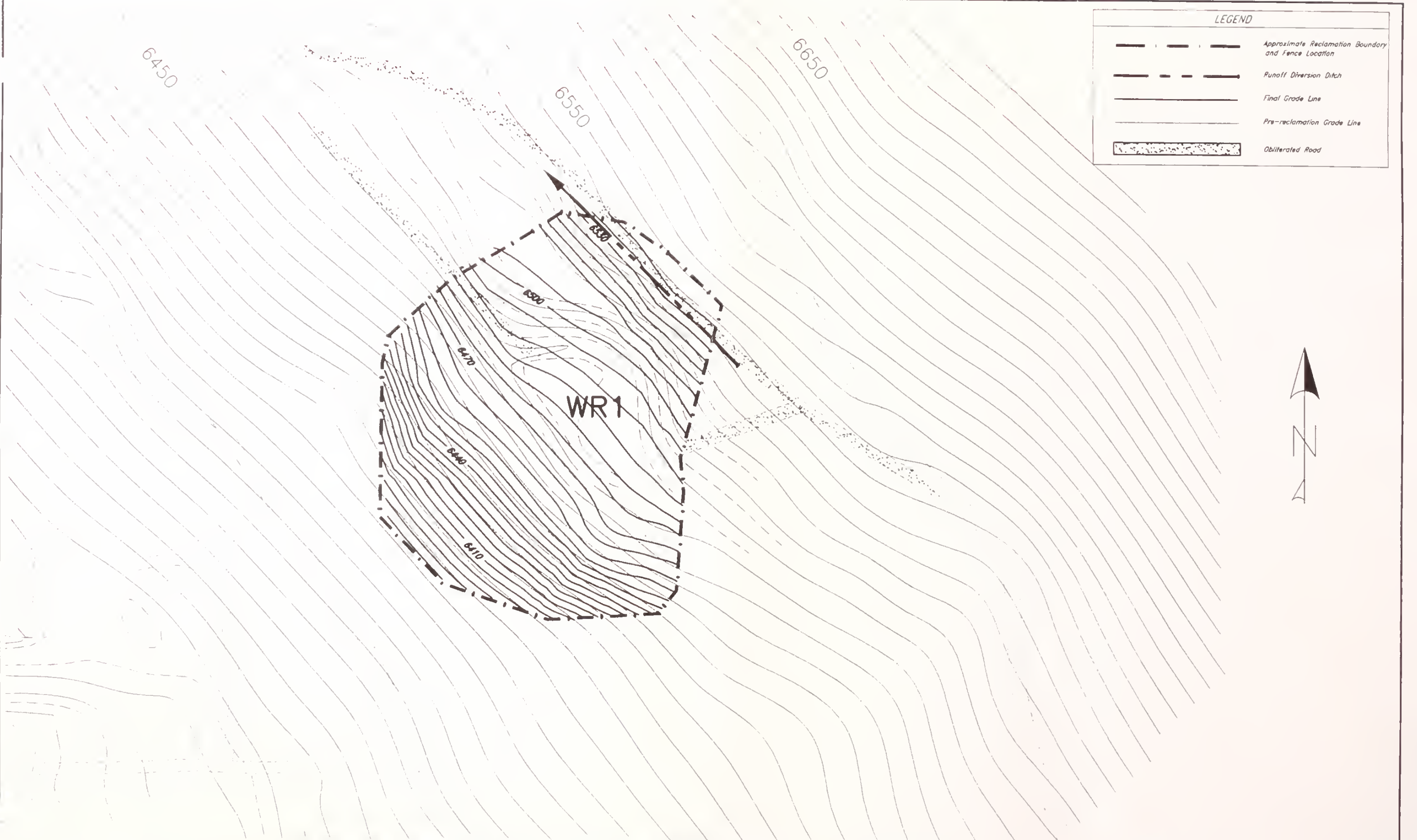
DRAWING NO.: PT340935 REV: -  
DATE: 6/25/95 PLOT SCALE: 1" = 200'



**APPENDIX I**  
**AS-BUILT DRAWINGS**












LEGEND

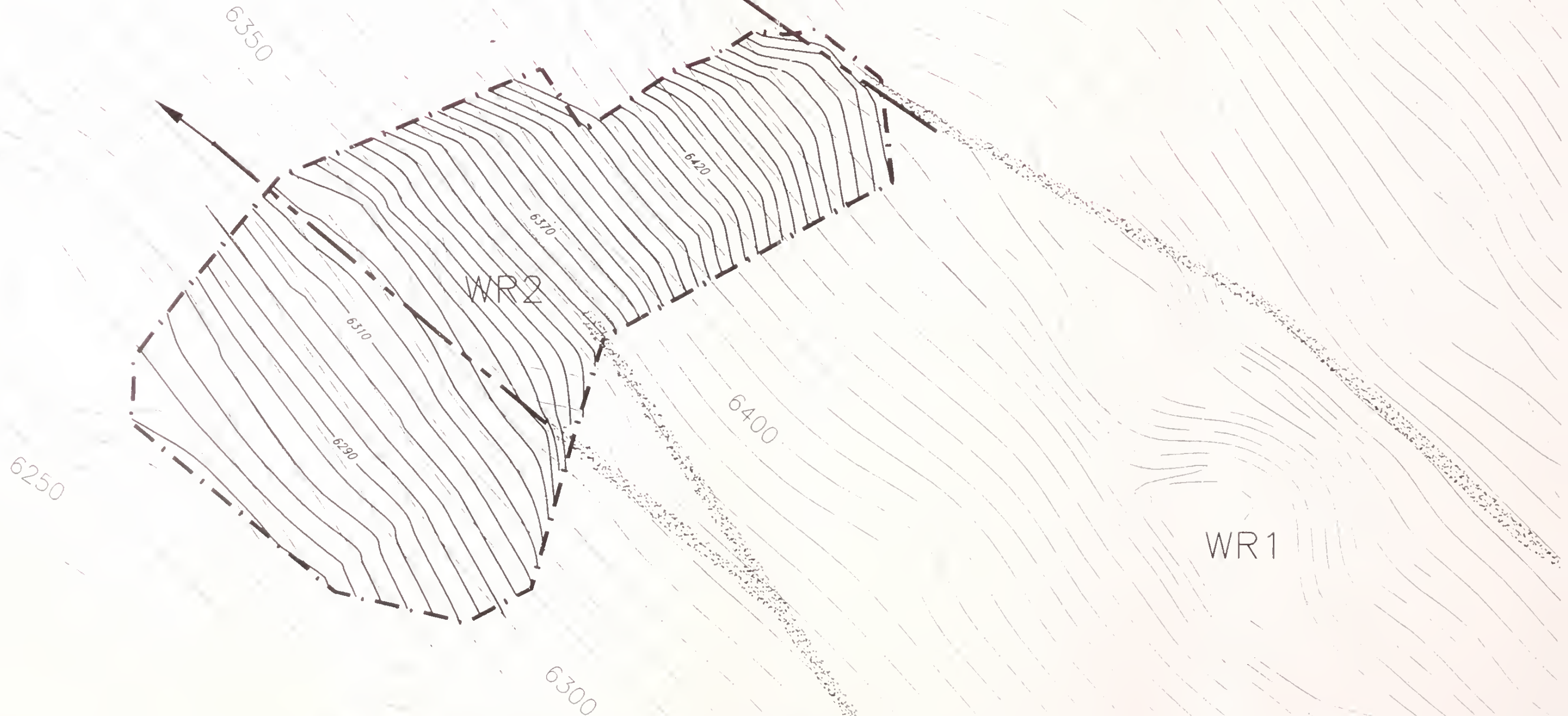
- Approximate Reclamation Boundary and Fence Location
- Runoff Diversion Ditch
- Final Grade Line
- Pre-reclamation Grade Line
- Obliterated Road





LEGEND

-  Approximate Reclamation Boundary and Fence Location
-  Runoff Diversion Ditch
-  Final Grade Line
-  Pre-reclamation Grade Line
-  Obliterated Road







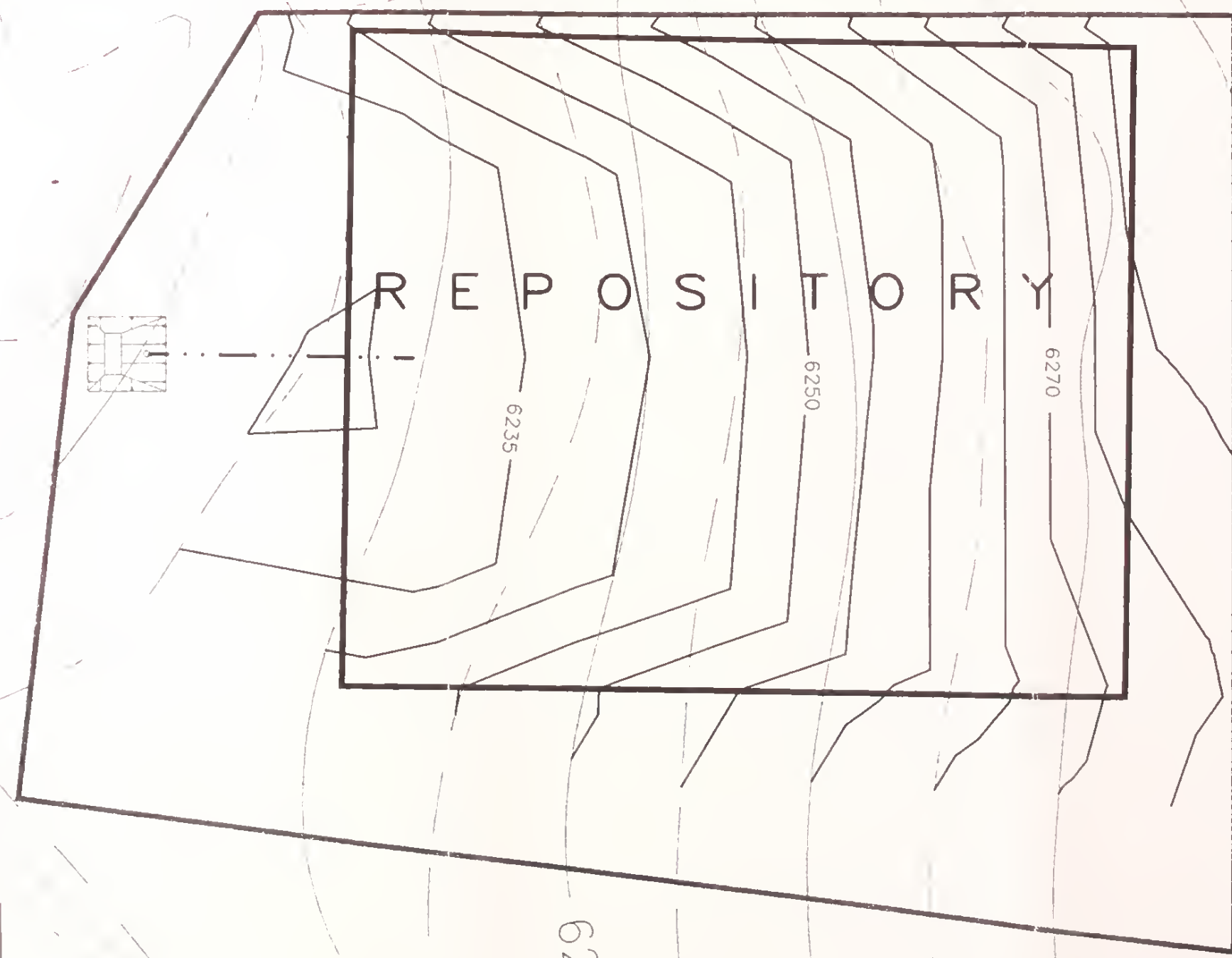


LEGEND	
	Approximate Reclamation Boundary and Fence Location
	Runoff Diversion Ditch
	Final Grade Line
	Pre-reclamation Grade Line
	Abolished Road

REFUGITORY

				P.O. CHECKED DESIGNED 12-28-95 DATE 3415 PROJECT NO.	SCALE HORIZ: 1" = 50' VERT: 1" = 50' SCALE IN FEET 0 25 50	 <b>TECHNICAL SERVICES, INC.</b> P.O. BOX 3446 BUTTE, MT 59708	DEQ GRANITE COUNTY BROOKLYN RECLAMATION	WR3 GRADING PLAN AS-BUILT	SHEET 3/7
NO.	BY	DATE	REVISION DESCRIPTION						





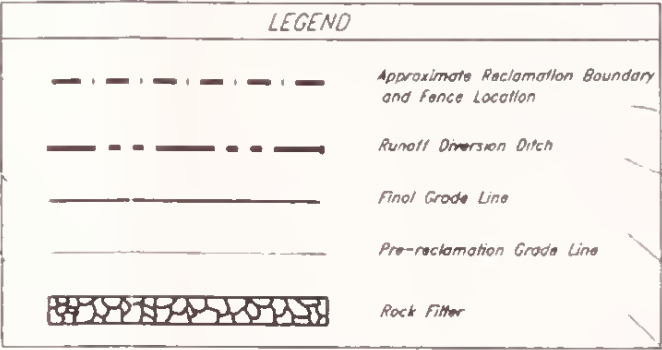
LEGEND	
	Repository Boundary
	Clearing Boundary
	Bottom Repository Grade Line
	Pre-reclamation Grade Line








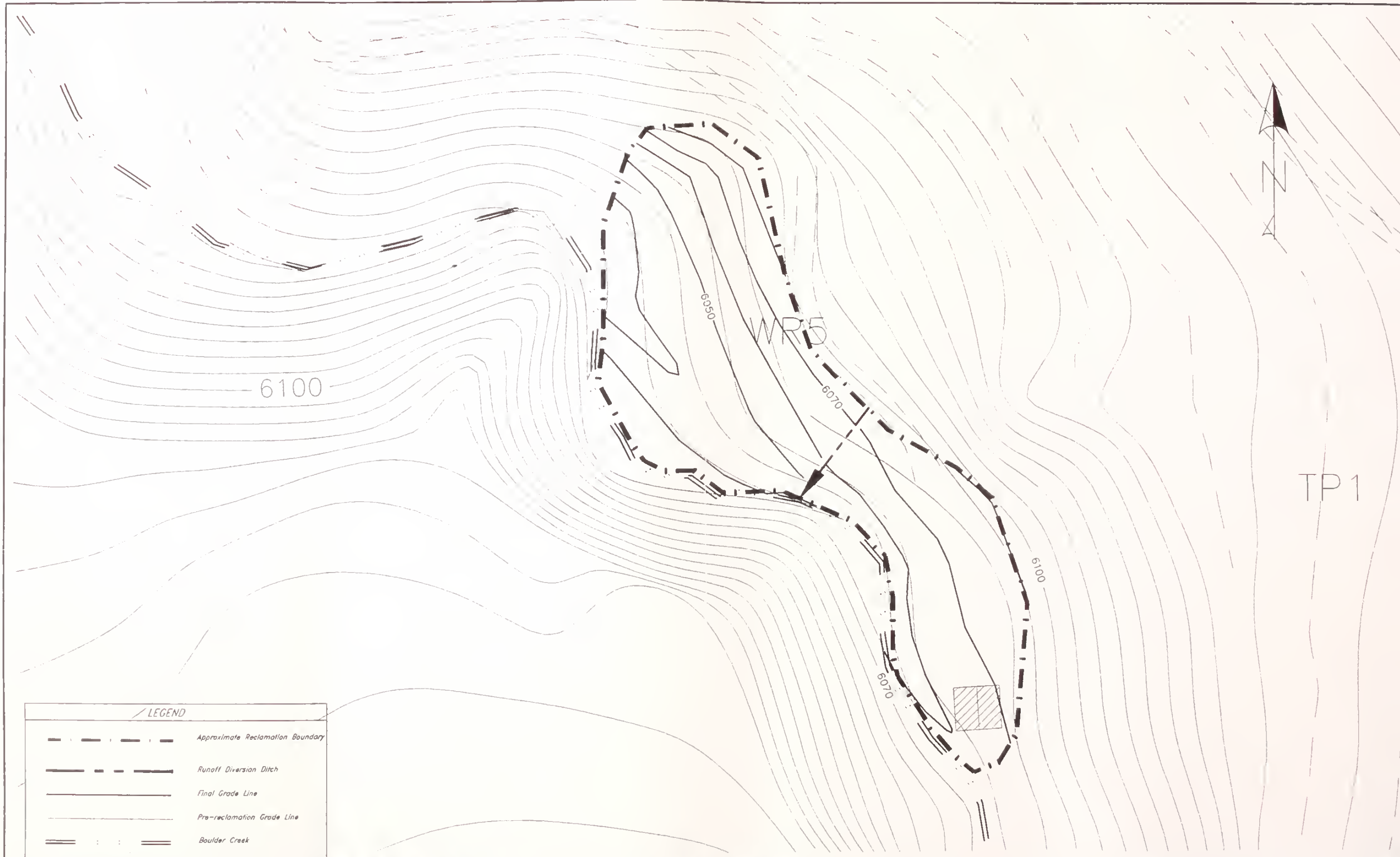









				D. CHASE DESIGNED		W.B. CHECKED		SCALE HORIZ: 1"=70' VERT: 1"=70'		 TECHNICAL SERVICES, INC.		DEQ GRANITE COUNTY BROOKLYN RECLAMATION		TAILINGS PLUS MIXING AND STORAGE AREA AS-BUILT		SHEET 6/7	
NO. BY DATE REVISION DESCRIPTION				W.B. APPROVED		1-2-81 DATE		M116 PROJECT NO.		P.O. BOX 3446 BUTTE, MT 59708							








LEGEND

-  Approximate Reclamation Boundary
-  Runoff Diversion Ditch
-  Final Grade Line
-  Pre-reclamation Grade Line
-  Boulder Creek

NO.	BY	DATE	REVISION DESCRIPTION

DESIGNED BY 1-3-94	CHECKED BY 1-3-94	SCALE HORIZ: 1"=40' VERT: 1"=40'
SCALE IN FEET 0 30 60		

**PIONEER**

TECHNICAL SERVICES, INC.  
P.O. BOX 3446  
BUTTE, MT 59708

DEQ  
GRANITE COUNTY  
BROOKLYN RECLAMATION

WR5 GRADING PLAN  
AS-BUILT







Fouder Creek diversion construction.



Fouder Creek stream diversion construction.



Clearing and grubbing in the soil mixing area.







Excavation within the soil mixing area.



Tree cutting adjacent to WR-3.



Full reconstruction to WR-5.



Tree cutting.





Logging consolidation on TP-1

8 2 '95



Initiation of logging of WR

8 3 '95



Temporary area clearing

8 3 '95



8 3 '95

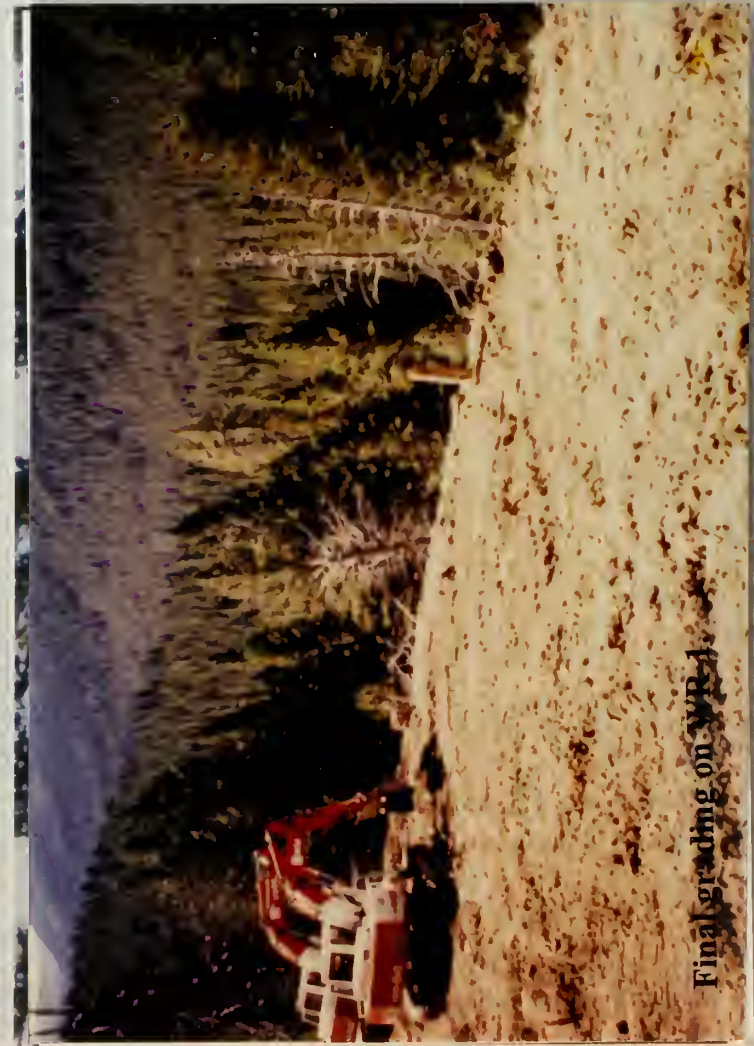




Recontouring of WR-1.



Recontouring of WR-1.



Final grading on WR-1.



Log truck removing trees from repository.





Building secondary containment for fuel truck.



Repository excavation.

8 13 '95



Repository excavation.



Excavating repository.





Excavating repository.

8 18 95



Repository excavation.

8 10 95



Soil mixing and storage area.

8 13 95





Mixing and storage area.



Ripping bottom of repository.



Repository in-grade preparation.



Placing GCL on repository.





Placing GCL and geonet on bottom of repository.



Placing geonēt on top of the GCL.



Placing GCL on repository.



Placing GCL over GCL and





showing float and gear

8-21-95



Installing leachate pipe (gravel cover).



installing leachate pipe



Installation of leachate transmission pipe





second half of the repository.



Covering the remaining part of the exposed fire

8 24 95



Topsoil on WR-1.











R contouring WR-2.



WR-3 graded out



Pushing waste down from the top of WR-2.



WR-2.





WR-3 graded out.



Setting charges for widening.



WR-4



Excavating WR-5.

6-28-78





Hauling waste from WR-5 to the repository.



Road down to WR-5.



Excavating WR-5.



Excavating WR-5.





Excavating WR-5.



Close-up of WR-5.



9 3 1995



9 3 1995





Spreading waste in the repository.



Liming WR-3.



WR-3 graded and topsoiled.







WR-5 creek area.



WR-5 being topsoiled.

9 12 '95



WR-5 being topsoiled.

9 18 '95



WR-5 being topsoiled.





oil on WR-5.



WR-5 area topsoiled.



oil on WR-5.



oil on WR-5.





on WR-5



Erosion on road streamside.



WR-5



stream side.





Fence post poundline around the tailings area

9 13 '95



Tailings area topsoiled.



Excavating tailings from the Nonpareil site.



Clearing tailings at the Nonpareil site.

9 17 '95





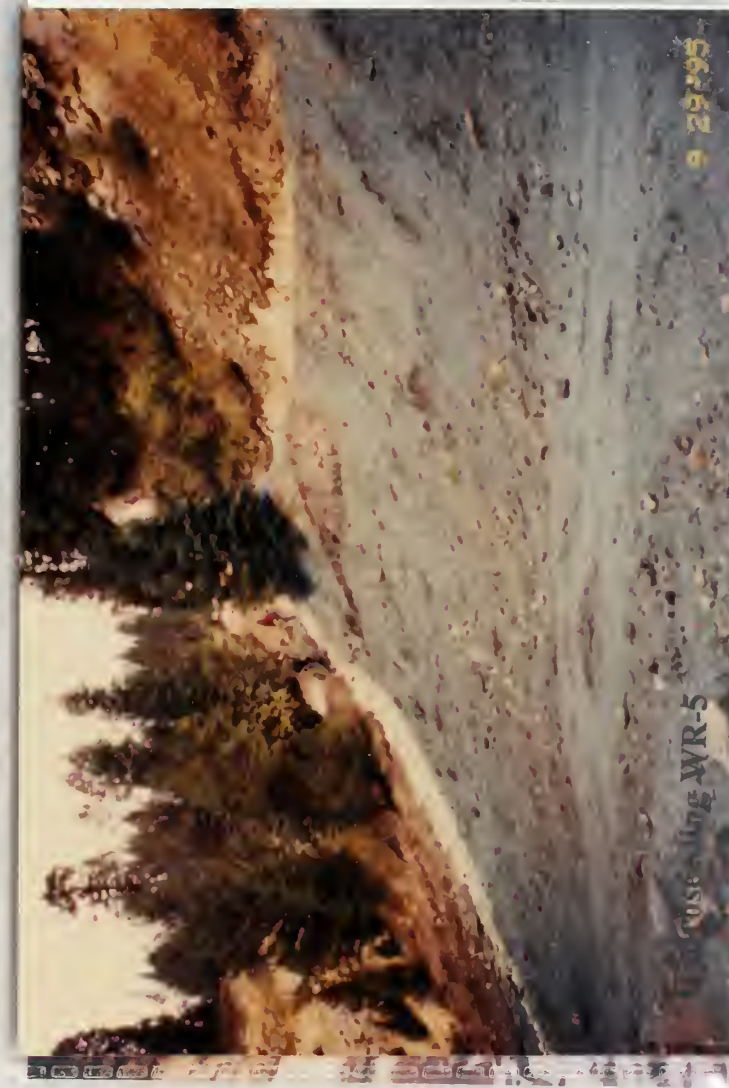
Clearing tailings at the Nonpareil site.



Top of WR-2 graded and topsoiled.



WR-2 graded and topsoiled.



Top of WR-5





Leaching leachate pond.



Waste placement in repository.



Repository capping.



Repository capping.





Topsoiling repositon

9 25 '95



Placing erosion control mat on WR-5.



Placing erosion control mat on WR-5.



Reconstructed stream channel.

10 10 '95





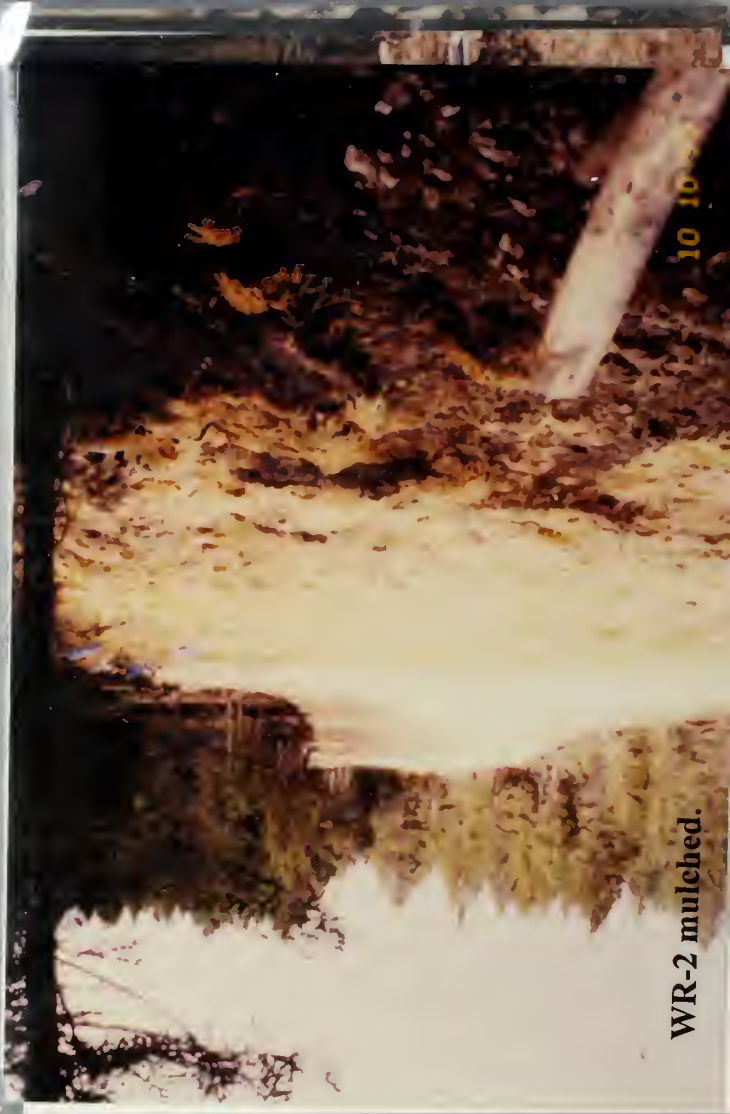
Stream channel.



Reconstructed stream channel.



WR-2 mulched.



WR-2 mulched.

10 10 10





Straw mulching of WR 3 and the



11-10-1911

11-10-1911





